

Date: Wednesday, 09/01/2008 7:16:01 AM
 User: Linda Lacelle

Process Sheet

Customer : CC-DAR01 Dart Aerospace Ltd.	Drawing Name : D205-765-011
Job Number : 36673	
Estimate Number : 10804	
P.O. Number :	Part Number : D205765011
This Issue : 09/01/2008 S.O. No. :	Drawing Number : PRELIM ISSUE-U/R
Prsht Rev. : NC	Project Number :
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : <i>CERTIFICATE OF CONFORMITY ONLY. 08.01.09</i>
Previous Run : 00015	Material :
Written By :	Due Date : 15/01/2008 Qty: 1 Um: Each
Checked & Approved By :	
Comment :	

Additional Product



Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D2127251907	TUNNEL ASSEMBLY
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 FOR LABOUR COSTS ONLY *36667*

2.0	D3648041	TUNNEL ASSEMBLY
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 TUNNEL ASSEMBLY *35973*

3.0	D36821	GASKET
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 GASKET *35974*

4.0	D36541	DOUBLER
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 DOUBLER *35899*

5.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
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Comment: SMALL & MEDIUM FAB RESOURCE 1 *08.01.09*

6.0	QC5	INSPECT WORK TO CURRENT STEP
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Comment: INSPECT WORK TO CURRENT STEP *09.01.09*

Date: Wednesday, 09/01/2008 7:16:01 AM
User: Linda Lacelle

Process Sheet

Customer: CC-DAR01 Dart Aerospace Ltd.

Drawing Name: D205-765-011

Job Number: 36673

Part Number: D205765011

Job Number:



Seq. #:

Machine Or Operation:

Description :

7.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

8.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

08/01/09

Job Completion



U 08.01.09

POSITIVE RECALL

EFFECTIVE *08.01.09* AUTH *U*

RELEASED _____ DATE _____



DART AEROSPACE LTD
1270 Aberdeen Street
Hawkesbury, ON, K6A 1K7
CANADA

Tel: 613 632 5200

Fax: 613 632 1185

Email: heli@dartaero.com
Web Site: www.dartaero.com

CERTIFICATE OF CONFORMANCE

Part no:	Description:	Drawing:	Quantity:	Batch
D205-765-011	Drive Shaft Tunnel Kit	IIN-D205-765 Rev. A	One	36673

The above kit contains the following components:

Part no:	Description:	Drawing:	Quantity:	Batch:
D3648-041	Drive Shaft Tunnel	D3648 Rev. A	One	35973
D3654-1	Doubler	D3654 Rev. A	One	35899
D3682-1	Gasket	D3682 Rev. A	One	35974

FOR THE THREE COMPONENTS LISTED ABOVE:
ALL MATERIALS AND PARTS HAVE BEEN INSPECTED AND COMPLY WITH THE
ASSOCIATED DRAWINGS LISTED ABOVE.

DATE: 8/Jan/2008

BY: Susanne Sheldon, eng
APPROVED QA SIGNATORY

Leanne Elsliger, P. Eng
DESIGN ENGINEER

L Lacelle

From: Richard Smith [rsmith@eaglecopters.com]
Sent: January 8, 2008 4:34 PM
To: 'Leanne Elsliger'
Cc: 'L Lacelle'; dcrowston@eaglecopters.com; bbeckett@dartaero.com
Subject: RE: Drive shaft tunnel

Leanne:

PO-07-003142 is for a tunnel that we have not received as yet. We are trying to clear up PO-07-002030 which we received the tunnel for fitting, which we did and it was installed on the aircraft. We need the paperwork for this one right now so we can close this workorder.

Thanks

Richard

-----Original Message-----

From: Leanne Elsliger [mailto:lslsliger@dartaero.com]
Sent: Tuesday, January 08, 2008 2:13 PM
To: 'L Lacelle'; 'Richard Smith'
Cc: bbeckett@dartaero.com; dcrowston@eaglecopters.com; 'David Shepherd'; 'Mike Petsche'
Subject: RE: Drive shaft tunnel

Richard: the PO (ref 07-003142) should have the following part number:
D205-765-011. This part number contains the three parts you listed in your email. I will send a new certificate of conformity via David Shepherd that references D205-765-011.

Linda: please create a work order for the D205-765-011 kit under batch number 36673. It should contain 1X D3648-041, 1X D3654-1 and 1X D3682-1.

Leanne

Leanne Elsliger, P.Eng
DART Aerospace Ltd.
1270 Aberdeen St.
Hawkesbury, ON, K6A 1K7
T: (613) 632-5200
F: (613) 632-9311

3650-041
3650-9

-----Original Message-----

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: January 8, 2008 3:16 PM
To: 'Richard Smith'
Cc: bbeckett@dartaero.com; dcrowston@eaglecopters.com; Leanne Elsliger
Subject: RE: Drive shaft tunnel

We have added it all into one P/N, BUT...Leanne says it's the wrong P/N to begin with...Leanne???

LL

-----Original Message-----

From: Richard Smith [mailto:rsmith@eaglecopters.com]
Sent: January 8, 2008 3:12 PM
To: 'L Lacelle'
Cc: bbeckett@dartaero.com; dcrowston@eaglecopters.com
Subject: RE: Drive shaft tunnel

Linda:

I was told that the tunnel now consists of three items. 1ea D3648-041 tunnel, 1ea D3682-1 gasket and 1ea D3654-1 doubler. These are the items that I added to the purchase order when I deleted the D212-725-1-907 part number.

I will need to know the pricing on each item.

Thanks

Richard

Date: Wednesday, 09/01/2008 7:14:05 AM
User: Linda Lacelle

Process Sheet

Customer : CC-DAR01 Dart Aerospace Ltd.	Drawing Name : D212-725-1-907
Job Number : 36667	
Estimate Number : 10804	
P.O. Number :	Part Number : D2127251907
This Issue : 09/01/2008 S.O. No. :	Drawing Number : PRELIM. ISSUE-U/R
Prsht Rev. : NC	Project Number :
First Issue : 08/01/2008 Type : SMALL /MED FAB	Drawing Revision :
Previous Run : 00015	Material :
Written By :	Due Date : 15/01/2008 Qty: 1 Um: Each
Checked & Approved By :	
Comment :	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D3648041	TUNNEL ASSEMBLY
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
TUNNEL ASSEMBLY

2.0	D3650041	WELDMENT ASSEMBLY, TOP PANEL
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
WELDMENT ASSEMBLY, TOP PANEL

3.0	D36509	ANGLE
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
ANGLE

4.0	D36821	GASKET
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
GASKET

5.0	D36541	DOUBLER
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
DOUBLER

6.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
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Comment: SMALL & MEDIUM FAB RESOURCE 1

Date: Wednesday, 09/01/2008 7:14:06 AM
User: Linda Lacelle

Process Sheet

Customer: CC-DAR01 Dart Aerospace Ltd.

Drawing Name: D212-725-1-907

Job Number: 36667

Part Number: D2127251907

Job Number:



Seq. #:

Machine Or Operation:

Description :

7.0

ENGINEERING 1

ENGINEERING RESOURCE #1



Comment: ENGINEERING RESOURCE #1

8.0

MFG ENGINEERING

MFG ENGINEERING



Comment: MFG ENGINEERING

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

10.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

11.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



Date: Wednesday, 09/01/2008 7:13:00 AM

User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35973	Customer	: Dart Helicopters Services
Estimate Number	: 13044	DWG Name	: DRIVE SHAFT TUNNEL
Purchase Order #	:	Part Number	: D3648041
Complete Date	: 27/11/2007 11:33:33	DWG Number	: D3648, D3650 U/R
Rev.	: U/R		

DUE DATE	ORDERED	DELIVERED
30/11/2007	1	1

2.0 AN960C10L-washer	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	AN960C10L	41.000	\$2.14	Lot # 106302 Qty. 41
Subtotal:	QTD:	41	CTD:	0	\$2.14

3.0 AN3C3A-Bolt	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	AN3C3A	41.000	\$14.97	Lot # 106277 Qty. 41
Subtotal:	QTD:	41	CTD:	0	\$14.97

4.0 D3649041-TUNNEL ASSEMBLY, BOTTOM PANEL	INVENTORY IT				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D3649041	1.000	\$143.22	Lot # 35710 Qty. 1
Subtotal:	QTD:	1	CTD:	0	\$143.22

9.0 D36509-ANGLE	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D36509	1.000	\$25.24	Lot # 35714 Qty. 1
09/01/2008	LACE01: Lacelle, Linda	D36509	1.000	\$26.54	Lot # 35714 Qty. 1
Subtotal:	QTD:	1	CTD:	1	\$51.78

10.0 D3650041-WELDMENT ASSEMBLY, TOP PANEL	INVENTORY ITE				
DATE	EMPLOYEE	TYPE	Qty	COST	
09/01/2008	LACE01: Lacelle, Linda	D3650041	1.000	\$131.59	Lot # 35715 Qty. 1
Subtotal:	QTD:	0	CTD:	1	\$131.59

11.0 D3651041-AFT BASE ASSEMBLY	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D3651041	1.000	\$297.09	Lot # 35850 Qty. 1
Subtotal:	QTD:	1	CTD:	0	\$297.09

	TIME	COST
Machine Time:	0.00	\$0.00
Labor:	0.00	\$0.00
Sub-contract (external Op.):		\$0.00
INVENTORY ITEM:		\$640.79
SUB-COMPONENT (SUB-JOB):		\$0.00
Total:		\$640.79

COST PER UNIT:	\$640.79
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3648-041

3650-041

3650-9

~~3681-1~~

3682-1
3654-1

3683

Date: Tuesday, 08/01/2008 9:50:39 AM

User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35973	Customer	: Dart Helicopters Services
Estimate Number	: 13044	DWG Name	: DRIVE SHAFT TUNNEL
Purchase Order #	:	Part Number	: D3648041
Complete Date	: 27/11/2007 11:33:33	DWG Number	: D3648, D3650 U/R
Rev.	: U/R		

DUE DATE	ORDERED	DELIVERED
30/11/2007	1	1

2.0 AN960C10L-washer	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	AN960C10L	41.000	\$2.14	Lot # 106302 Qty. 41
Subtotal:	QTD:	41	CTD:	0	\$2.14

3.0 AN3C3A-Bolt	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	AN3C3A	41.000	\$14.97	Lot # 106277 Qty. 41
Subtotal:	QTD:	41	CTD:	0	\$14.97

4.0 D3649041-TUNNEL ASSEMBLY, BOTTOM PANEL	INVENTORY IT				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D3649041	1.000	\$143.22	Lot # 35710 Qty. 1
Subtotal:	QTD:	1	CTD:	0	\$143.22

9.0 D36509-ANGLE	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D36509	1.000	\$25.24	Lot # 35714 Qty. 1
Subtotal:	QTD:	1	CTD:	0	\$25.24

10.0 D3651041-AFT BASE ASSEMBLY	INVENTORY ITEM				
DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	D3651041	1.000	\$297.09	Lot # 35850 Qty. 1
Subtotal:	QTD:	1	CTD:	0	\$297.09

		TIME	COST
	Machine Time:	0.00	\$0.00
	Labor:	0.00	\$0.00
	Sub-contract (external Op.):		\$0.00
	INVENTORY ITEM:		\$482.66
	SUB-COMPONENT (SUB-JOB):		\$0.00
Total:			\$482.66

COST PER UNIT:	\$482.66
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00203
20 hrs.

Eric Charbonneau

From: Eric Charbonneau [echarbonneau@dartaero.com]
Sent: November 14, 2007 9:44 AM
To: Mike Petsche; Roberto Fuentes (rfuentes@dartaero.com)
Cc: Linda Lacelle (llacelle@dartaero.com)
Subject: drive shaft tunnel

Good morning guys, since we are making parts from drawings that are not released I will need a preliminary ECN in order to continue, this project as been going against our normal system since day one. Maybe we should have assigned an engineer here in Hawkesbury for this project to follow our normal procedures for new product, something we should consider for future projects that get designed in Calgary.

Thanks,

ERIC CHARBONNEAU
Production Engineering Coordinator

DART aerospace Ltd.

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

11/27/2007

L Lacelle

From: Bill Beckett [bbeckett@dartaero.com]
Sent: January 8, 2008 6:48 AM
To: 'L Lacelle'
Cc: 'Brigitte Golden'; Richard Smith; Dave Crowston; David Shepherd
Subject: FW: Drive shaft tunnel

Linda,
Please get the costs for this Tunnel to Richard Smith so that he can give us a corrected PO. I would like to invoice today.
Thanks,
Bill

-----Original Message-----

From: David Crowston [mailto:dcrowston@eaglecopters.com]
Sent: January 7, 2008 5:19 PM
To: Bill Beckett (E-mail)
Subject: FW: Drive shaft tunnel

Bill,
Dave S got me a certificate of conformity for the tunnel parts. I will get Richard Smith to Get the PO adjusted so we can process the billing.
Dave C

-----Original Message-----

From: David Crowston [mailto:dcrowston@eaglecopters.com]
Sent: Monday, January 07, 2008 11:16 AM
To: Bill Beckett (E-mail)
Subject: FW: Drive shaft tunnel

Bill,
I sent this to Dave while he was out there before christmas but he may have forgotten it. You might be able to direct it to the right person. Delivery for this aircraft is in about a week so we need the paperwork to close the work order.
Thank you.
Dave C

-----Original Message-----

From: David Crowston [mailto:dcrowston@eaglecopters.com]
Sent: Friday, December 14, 2007 12:35 PM
To: David Shepard (E-mail)
Subject: Drive shaft tunnel

Dave,
I presume you are out in Hawksbury. Can you talk to whoever you need to get certification sent to us for the first drive shaft tunnel? We never officially received it.
It fit well now and we will keep it as a "part" for this aircraft.
It was ordered on PO 07-002030 (P/N D212-725-1-907) Thanks Dave C

Date: Tuesday, 08/01/2008 9:48:29 AM

User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35899	Customer	: Dart Helicopters Services
Estimate Number	: 13055	DWG Name	: DOUBLER
Purchase Order #	:	Part Number	: D36541
Complete Date	: 27/11/2007 10:47:51	DWG Number	: D3654 UNDER REVIEW
		Rev.	: U/R

DUE DATE	ORDERED	DELIVERED
27/11/2007	1	1

1.0 M304S16GA-304/316 .063 Sheet	INVENTORY ITEM
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DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	M304S16GA	0.368	\$3.35	Lot # 105061 Qty. 0

Subtotal:	QTD: 0	CTD: 0	\$3.35
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		TIME	COST
	Machine Time:	0.00	\$0.00
	Labor:	0.00	\$0.00
	Sub-contract (external Op.):		\$0.00
	INVENTORY ITEM:		\$3.35
	SUB-COMPONENT (SUB-JOB):		\$0.00
Total:			\$3.35

COST PER UNIT:	\$3.35
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Date: Tuesday, 08/01/2008 9:48:05 AM
User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35714	Customer	: Dart Helicopters Services
Estimate Number	: 13034	DWG Name	: TOP PANEL ASSY
Purchase Order #	:	Part Number	: D36509
Complete Date	: 27/11/2007 10:49:13	DWG Number	: D3650 UNDER REVIEW
		Rev.	: U/R

DUE DATE	ORDERED	DELIVERED
21/11/2007	1	2

1.0 M304S24GA-304/316 .025 Sheet INVENTORY/ITEM

DATE	EMPLOYEE	TYPE	Qty	COST	
19/11/2007	BLEC01: Bleck, Henry	M304S24GA	0.010	\$0.06	Lot # 105592 Qty. 0
27/11/2007	LACE01: Lacelle, Linda	M304S24GA	0.900	\$5.04	Lot # 105592 Qty. 1

Subtotal: QTD: 0 CTD: 1 \$5.10

2.0 WATER JET Internal Operation

DATE	EMPLOYEE	TYPE	Qty	Time(hrs)	COST	MTime(hrs)	Mach. Cost
19/11/2007	BLEC01: Bleck, Henry	Run	2.000	1.33	\$20.68	1.33	27.30

Subtotal: QTD: 2 CTD: 0 1.33 \$47.98

		TIME	COST
	Machine Time:	1.33	\$27.30
	Labor:	1.33	\$20.68
	Sub-contract (external Op.):		\$0.00
	INVENTORY ITEM:		\$5.10
	SUB-COMPONENT (SUB-JOB):		\$0.00
Total:			\$53.08

COST PER UNIT: \$26.54

Date: Tuesday, 08/01/2008 9:47:30 AM
 User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35715	Customer	: Dart Helicopters Services
Estimate Number	: 13067	DWG Name	: TOP PANNEL ASS'Y
Purchase Order #	:	Part Number	: D3650041
Complete Date	: 27/11/2007 11:11:55	DWG Number	: D3650 UNDER REVIEW
		Rev.	: U/R

DUE DATE	ORDERED	DELIVERED
21/11/2007	1	1

1.0 MS20427M33-Rivet INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	MS20427M33	88.000		\$8.75	Lot # 105728 Qty. 88
Subtotal: QTD: 88 CTD: 0 \$8.75						

3.0 D36501-AFT PANEL INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	D36501	1.000		\$30.17	Lot # 35707 Qty. 1
Subtotal: QTD: 1 CTD: 0 \$30.17						

4.0 D36503-CENTER PANEL INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	D36503	1.000		\$22.25	Lot # 35708 Qty. 1
Subtotal: QTD: 1 CTD: 0 \$22.25						

5.0 D36505-CENTER PANEL INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	D36505	1.000		\$65.58	Lot # 35709 Qty. 1
Subtotal: QTD: 1 CTD: 0 \$65.58						

6.0 AN3C3A-Bolt INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	AN3C3A	12.000		\$4.38	Lot # 106277 Qty. 12
Subtotal: QTD: 12 CTD: 0 \$4.38						

7.0 AN960C10-WASHER INVENTORY ITEM						
DATE	EMPLOYEE	TYPE	Qty		COST	
27/11/2007	LACE01: Lacelle, Linda	AN960C10	12.000		\$0.46	Lot # 106302 Qty. 12
Subtotal: QTD: 12 CTD: 0 \$0.46						

		TIME	COST
	Machine Time:	0.00	\$0.00
	Labor:	0.00	\$0.00
	Sub-contract (external Op.):		\$0.00
	INVENTORY ITEM:		\$131.59
	SUB-COMPONENT (SUB-JOB):		\$0.00
Total:			\$131.59
COST PER UNIT:		\$131.59	

Date: Tuesday, 08/01/2008 9:43:01 AM

User: Linda Lacelle

JOB HISTORY : DETAIL

Job Number	: 35974	Customer	: Dart Helicopters Services
Estimate Number	: 13035	DWG Name	: GASKET
Purchase Order #	:	Part Number	: D36821
Complete Date	: 27/11/2007 10:44:01	DWG Number	: D3682 UNDER REVIEW
		Rev.	: U/R

DUE DATE	ORDERED	DELIVERED
30/11/2007	1	1

1.0	G89-coated cloth	INVENTORY ITEM
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DATE	EMPLOYEE	TYPE	Qty	COST	
27/11/2007	LACE01: Lacelle, Linda	G89	0.353	\$6.92	Lot # 105928 Qty. 0

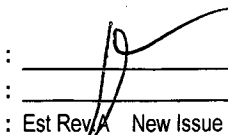
Subtotal:	QTD: 0	CTD: 0	\$6.92
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	TIME	COST
Machine Time:	0.00	\$0.00
Labor:	0.00	\$0.00
Sub-contract (external Op.):		\$0.00
INVENTORY ITEM:		\$6.92
SUB-COMPONENT (SUB-JOB):		\$0.00
Total:		\$6.92

COST PER UNIT:	\$6.92
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Date: Friday, 11/23/2007 11:42:29 AM
 User: Chantal Lavoie

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : DRIVE SHAFT TUNNEL
Job Number : 35973	
Estimate Number : 13044	
P.O. Number :	Part Number : D3648041
This Issue : 11/23/2007 S.O. No. :	Drawing Number : D3648, D3650 U/R
Prsht Rev. : NC	Project Number : N/A
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : U/R
Previous Run : 35016	Material :
Written By : 	Due Date : 11/30/2007 Qty: 1 Um: Each
Checked & Approved By :	
Comment : Est Rev/A New Issue 07-10-03 EC verified by: DD	



Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	PACKAGING 1	PACKAGING RESOURCE #1
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Comment: PACKAGING RESOURCE #1
 Pick Packing Kit

2.0	AN960C10	washer
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Comment: Qty.: 41.0000 Each(s)/Unit Total : 41.0000 Each(s)
 washer
 batch: M 106302

3.0	AN3C10A AN3C-3A	Bolt
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Comment: Qty.: 41.0000 Each(s)/Unit Total : 41.0000 Each(s)
 Bolt
 batch: M106277

4.0	D3649041	TUNNEL ASSEMBLY, BOTTOM PANEL
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 TUNNEL ASSEMBLY, BOTTOM PANEL
 batch: B35710

5.0	D36501	AFT PANEL
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 AFT PANEL
 batch: B35707

 07.11.23

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 11/23/2007 11:42:30 AM
User: Chantal Lavoie

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: DRIVE SHAFT TUNNEL

Job Number: 35973

Part Number: D3648041



Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

D36503

CENTER PANEL



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CENTER PANEL

batch: B35708

AB *2nd-23*

7.0

D36505

CENTER PANEL



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CENTER PANEL

batch: B35709

8.0

D36507

SEAL



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

SEAL

batch: _____

9.0

D36509

ANGLE



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

ANGLE

batch: _____

10.0

D3651041

AFT BASE ASSEMBLY



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

AFT BASE ASSEMBLY

batch: B35850

11.0

NAS9307M403

RIVET



Comment: Qty.: 12.0000 Each(s)/Unit Total : 12.0000 Each(s)

RIVET

batch: _____

12.0

AN960C4

WASHER



Comment: Qty.: 12.0000 Each(s)/Unit Total : 12.0000 Each(s)

WASHER

batch: _____

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 11/23/2007 11:42:30 AM
User: Chantal Lavoie

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: DRIVE SHAFT TUNNEL

POSITIVE
RECALL

Job Number: 35973

Part Number: D3648041

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

SMALL FAB 1

SMALL & MEDIUM FAB RESOURCE 1



Comment: SMALL & MEDIUM FAB RESOURCE 1

1-Assemble as per dwg D3648 and D3650

2-Seal gaps using 3M 1357 adhesive batch: M105623

18.07.11.23

14.0

QC5

INSPECT WORK TO CURRENT STEP



4E
07.11.23



Comment: INSPECT WORK TO CURRENT STEP

15.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

QRTN - D3648

07.11.23 ①

16.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

18.07.11.27
18.07.11.27

Job Completion



POSITIVE RECALL

EFFECTIVE 07.11.23 AUTH 1

RELEASED _____ DATE _____

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1

D

C

B

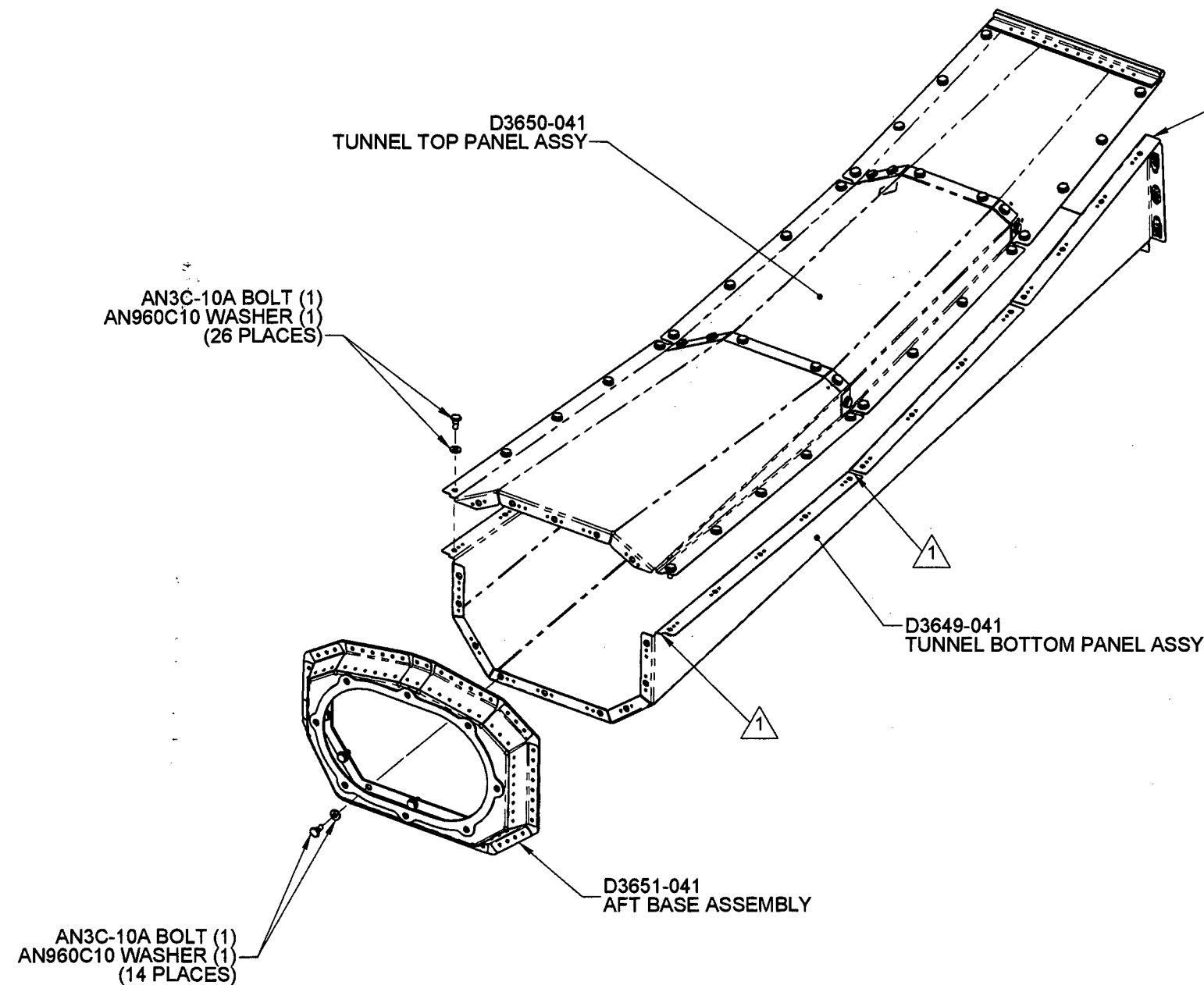
A

D

C

B

A



PART LIST

QTY -041	PART NUMBER	DESCRIPTION
X	D3648-041	DRIVE SHAFT TUNNEL ASSYMBLY
1	D3649-041	TUNNEL BOTTOM PANEL ASSEMBLY
1	D3650-041	TUNNEL TOP PANEL ASSEMBLY
1	D3651-041	AFT BASE ASSEMBLY
40	AN3C-10A	BOLT
40	AN960C10	WASHER

PRELIMINARY ISSUE

NOTES:

- 1) SEAL ANY TYPICAL GAPS USING 3M HIGH PERFORMANCE CONTACT ADHESIVE 1357
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3648-041 USING FINE POINT PERMANENT INK MARKER
- 7) TORQUE FASTENERS TO 15-25 in-lb
- 8) WEIGHT: 9.2 lbs

D3648-041 DRIVE SHAFT TUNNEL ASSEMBLY

A	NEW ISSUE		RF	07.11.07
REV.	DESCRIPTION		BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
DRAWN	RF			
CHECKED		DRAWING NO.	REV. A	
MFG. APPR.		D3648	SHEET 1 OF 1	
APPROVED		TITLE	SCALE	
DE APPR.		DRIVE SHAFT TUNNEL ASSY	1:12	
DATE	07.11.07		COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

Dart Aerospace Ltd

1270 Aberdeen Street
Hawkesbury, Ontario K6A 1K7

Transfer Slip

Date Nov 27, 2007	Page 1
Transfer Number TRF0000037	

Transfer To:

Quarantine	QRNTN
------------	-------

Transfer From:

DACALG

Reference	Description	Required By Nov 27, 2007
-----------	-------------	-----------------------------

Item Number	Description	Quantity Transferred	UOM	Quantity Received
D3648041	TUNNEL ASSEMBLY	1.0000	Each	

Comments:



DART AEROSPACE LTD
1270 Aberdeen Street
Hawkesbury, ON, K6A 1K7
CANADA

Tel: 613 632 5200

Fax: 613 632 1185


Email: heli@dartaero.com
Web Site: www.dartaero.com

CERTIFICATE OF CONFORMANCE

Part no:	Description:	Drawing:	Quantity:	Batch:
D3648-041	Drive Shaft Tunnel	D3648 Rev. A	One	35973
D3654-1	Doubler	D3654 Rev. A	One	35899
D3682-1	Gasket	D3682 Rev. A	One	35974

ALL MATERIALS AND PARTS HAVE BEEN INSPECTED AND COMPLY WITH THE
DRAWINGS LISTED ABOVE.



DATE: 7/Jan/2008


BY: Susanne Sheldon, eng
APPROVED QA SIGNATORY


Leanne Elsliger, P. Eng
DESIGN ENGINEER

Date: Tuesday, 11/13/2007 2:29:00 PM
User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : WELDMENT TOP PANEL	
Job Number : 35707	Part Number : D36501	
Estimate Number : 13028	Drawing Number : D3650 UNDER REVIEW	
P.O. Number :	Project Number : N/A	
This Issue : 11/13/2007 S.O. No. :	Drawing Revision : U/R	
Prsht Rev. : NC	Material :	
First Issue : 11/13/2007 Type : SMALL /MED FAB	Due Date : 11/20/2007	Qty: 1 Um: Each
Previous Run : 35147		
Written By : 		
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
----------------	------------------------------	----------------------

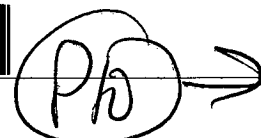
1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 1.6622 sf(s)/Unit Total : 1.6622 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 165592 HB 07-11-14



1st Page

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3650

Dwg Rev: PRE.L

Prog Rev: PRE.L

HB 07-11-14

2-Deburr if necessary

HB 07-11-14

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



HB 07-11-14

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

HB 07.11.14

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3650

HB 07.11.22 D

Date: Tuesday, 11/13/2007 2:29:00 PM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: WELDMENT TOP PANEL

Job Number: 35707

Part Number: D36501

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

7.0

MS20427M33

Rivet



Comment: Qty.: 22.0000 Each(s)/Unit Total : 22.0000 Each(s)

Rivet

batch: M105728

8.0

MS210603K

Nut Plate



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Nut Plate

batch: M105938

9.0

MS210623K

Nut Plate



Comment: Qty.: 3.0000 Each(s)/Unit Total : 3.0000 Each(s)

Nut Plate

batch: M105938

10.0

SMALL FAB 1

SMALL & MEDIUM FAB RESOURCE 1



Comment: SMALL & MEDIUM FAB RESOURCE 1

Assemble as per dwg D3650

07.11.22 ②

11.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07.11.23

12.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

07.11.22 ①

07.11.22 ①

Date: Tuesday, 11/13/2007 2:29:00 PM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: WELDMENT TOP PANEL

Job Number: 35707

Part Number: D36501

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

D07-11.27

Job Completion



U A.U.27

POSITIVE RECALL

EFFECTIVE 07.11.14 AUTH U

RELEASED _____ DATE _____

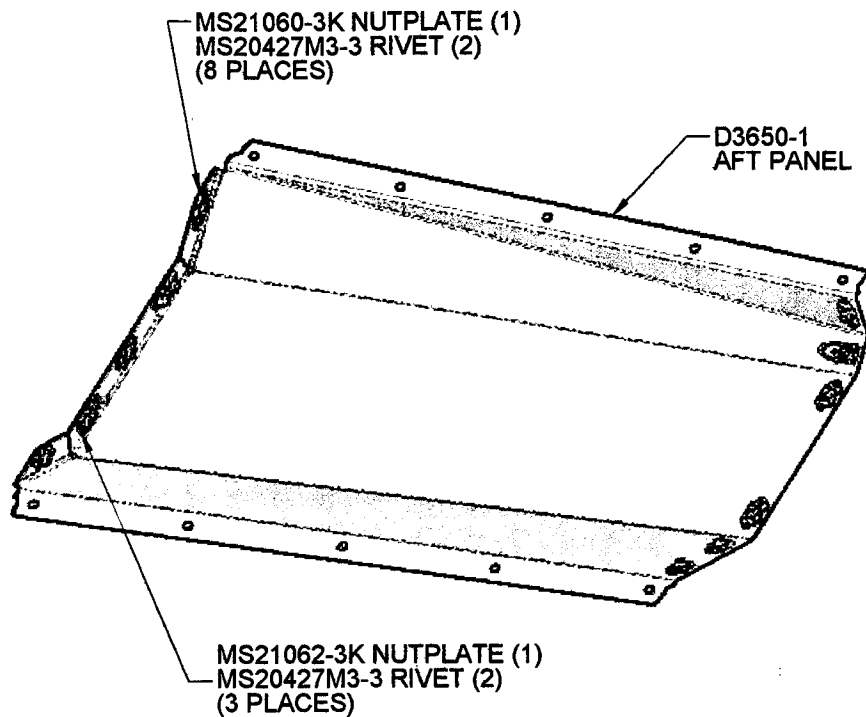
SEE ATTACHED STEPS

129

126

12C

UE 07.11.22



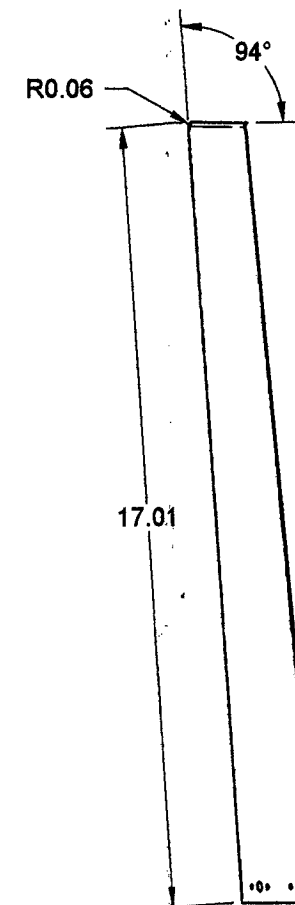
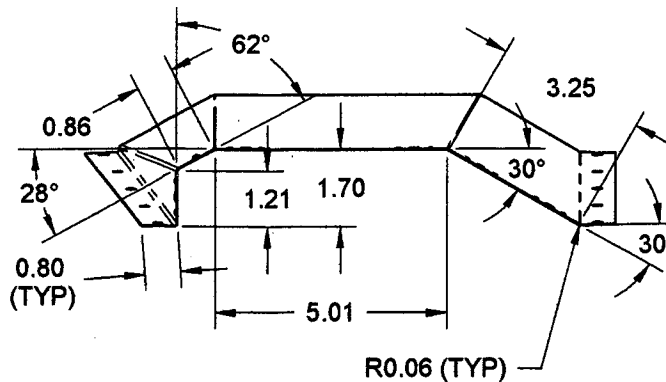
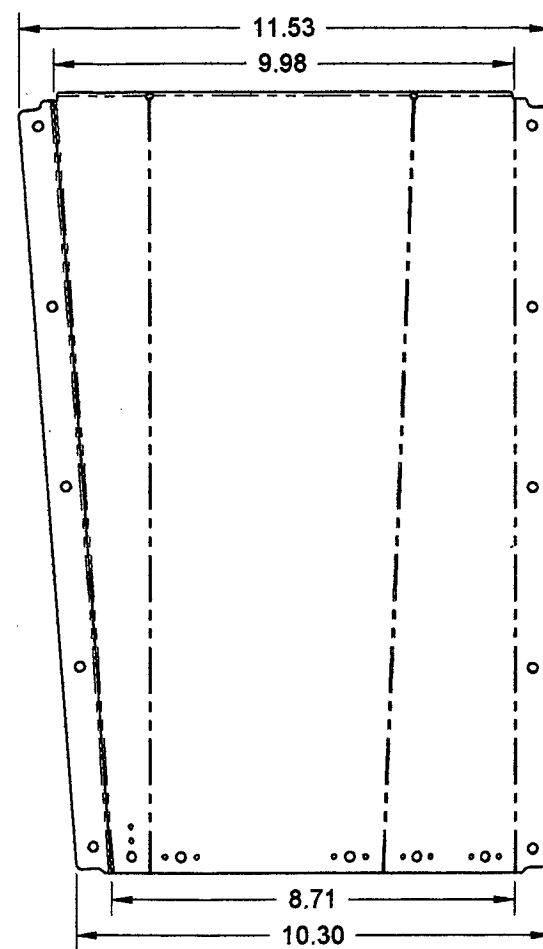
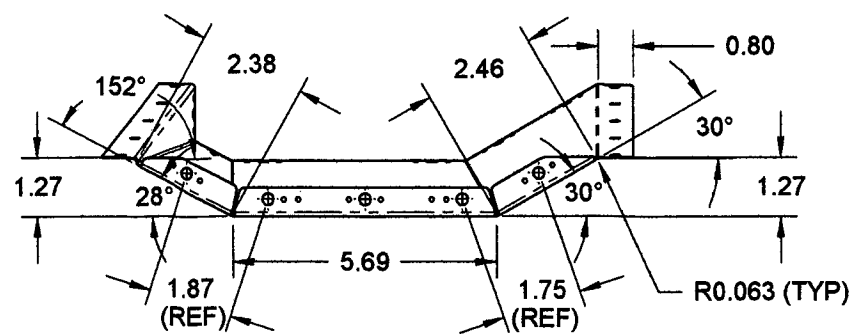
D3650-1 AFT PANEL

PART LIST

QTY -1	PART NUMBER	DESCRIPTION
X	D3650-1	AFT PANEL
22	MS20427M3-3	RIVET
8	MS21060-3K	NUTPLATE
3	MS21062-3K	NUT PLATE

NOTES:

- 1) FINISH: NONE
- 2) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 3) UNITS: INCHES UNLESS OTHERWISE NOTED
- 4) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 5) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-1 USING FINE POINT PERMANENT INK MARKER
- 6) WEIGHT: 1.3 lbs



**D3650-1 AFT PANEL BEND DETAIL
(MAKE FROM D3650-1F FLAT PATTERN)**

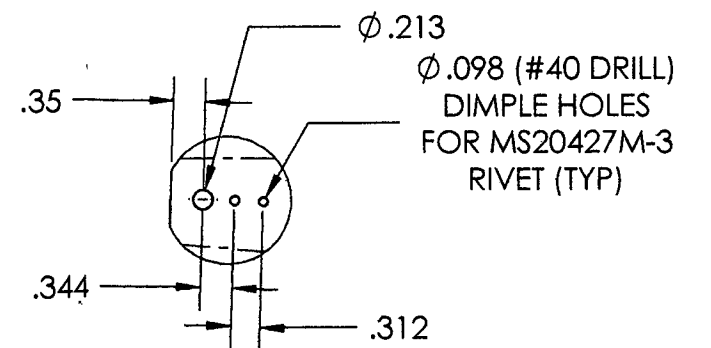
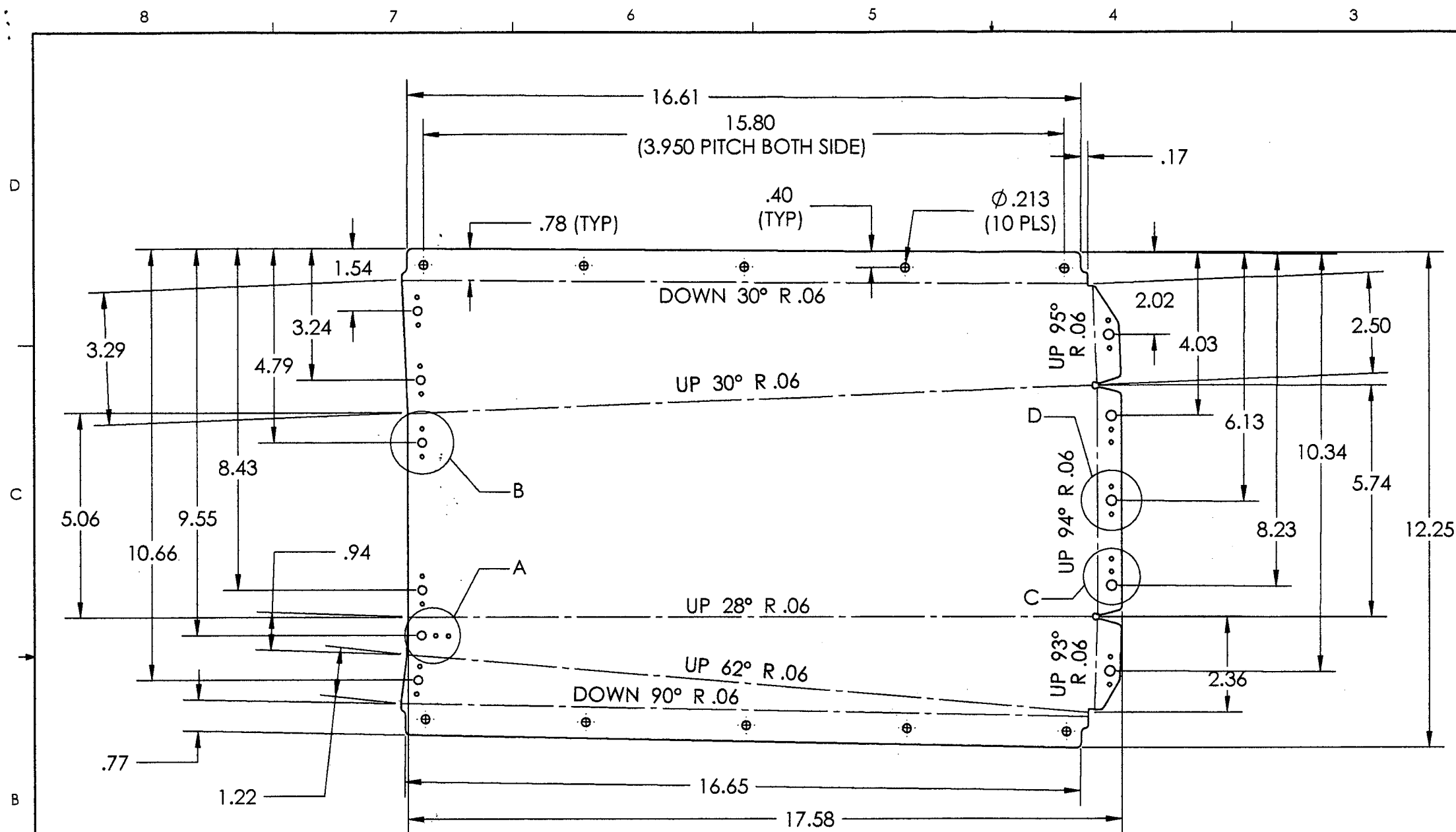
PRELIMINARY ISSUE

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3650	SHEET 2 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:4
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

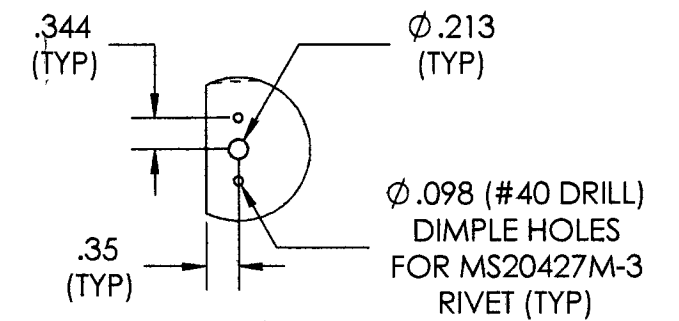
RESEARCH

4

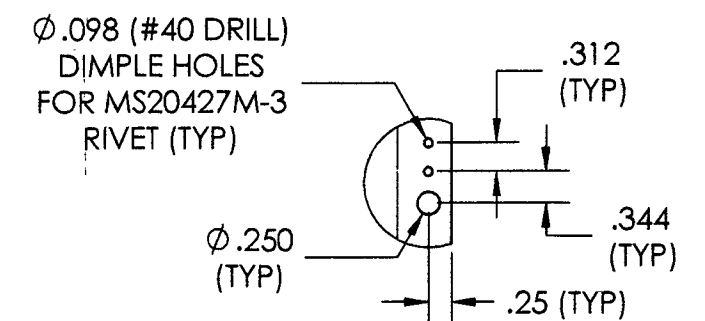
[illegible]



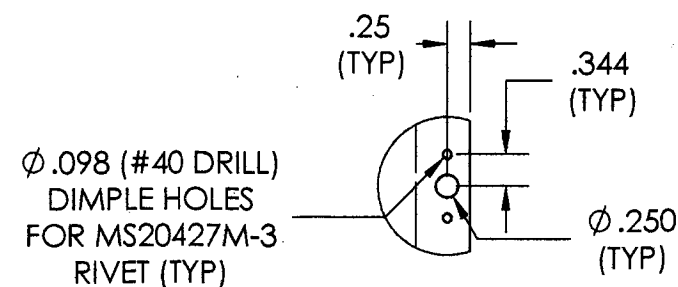
DETAIL A
SCALE 1 : 1



DETAIL B
SCALE 1 : 1



DETAIL C
SCALE 1:2



DETAIL D
SCALE 1 : 2

PRELIMINARY ISSUE

D3650-1F FLAT PATTERN

NOTES:

- NOTES:**
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET,
PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-5 USING FINE POINT PERMANENT INK MARKER

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3650	SHEET 3 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:5
DATE 07.11.07		COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

102

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102

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DART AEROSPACE LTD		Work Order:	35707
Description: WELD MENT TOP PANEL		Part Number:	D3650-1
Inspection Dwg: D3650-1 Rev: PRE L		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø .098	+ .004 - .001	.100				
Ø .213	+ .005 - .001	.215				
.312	+/- .000	.312				
.344	+/- .010	.344				
.35	+/- .030	.35				
12.25	+/- .030	12.25				
10.34	+/- .030	10.34				
16.61	+/- .030	16.61				
15.86	+/- .030	15.86				
10.66	+/- .030	11.66				
9.55	+/- .030	9.55				
8.43	+/- .030	8.43				
17.58	+/- .030	17.58				
16.65	+/- .030	16.65				
.40	+/- .030	.40				

Measured by:	RB
Date:	07-11-14

Audited by:	RB
Date:	07-11-14

Prototype Approval:	
Date:	

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	

W/o 35707

VE
07.11.22 Step 12a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

07/11/23

VE
07.11.22 Step 12b

QC5 (Upon receipt of STC)

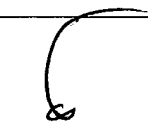
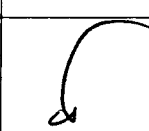
VE
07.11.22 Step 12c

Remove positive recall and release part to Eagle Copters

07

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: 22 Date: 07/11/22
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/22	# 1.0	wrong mat. was used. 0.018" instead of 0.025" thick.	UE 07.11.22	mat. thickness is acceptable this one time only	UE 07.11.22 B	 07/11/22	UE 07.11.22	 07/11/22
				see attached email				

NOTE: Date & initial all entries

Jason Murdoch

From: Susanne Sheldon [ssheldon@dartaero.com]
Sent: Thursday, November 15, 2007 2:37 PM
To: 'L Lacelle'; 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Dale is opening a corrective action to add a gauge thickness chart to QSI003 - Metal fabrication. We will also review the receiving/inspection procedure for marking the sheet metal, the thickness tolerances on sheet metal and the tolerances on the measuring instruments used. All input is welcome.
Susanne

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: November 15, 2007 2:12 PM
To: 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

COMPLETELY agree!!

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: November 15, 2007 1:41 PM
To: 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Hello all,

Just to confirm ... 0.018" is good for me ... whatever works for production ... minimum requirement is 0.015".

I think Jason's suggestion to add a gauge thickness chart to a QSI is a good idea.
The confusing thing is that it varies between stainless and carbon steel.
Maybe not QSI 017 or 018 ... perhaps the Sheet Metal Fabrication QSI.

David

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: Wednesday, November 14, 2007 3:11 PM
To: 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Also what becomes an issue, is that the material is being identified in gauge instead of in inches. This causes workers to pull 25ga material instead of 0.025", for example. Keep in mind, workers are SUPPOSED to verify the thickness of the material before use. The use of gauge is not mentioned in QSI 017 or QSI 018 (QSI 018 does mention " dimensions are in inches " see section 4.1). If the use of gauge will continue, I find it necessary that we should have this included in the QSI, with a chart of gauge converted into inches, along with a tolerance, for each material that we use, since each is different, and approved by engineering.

jmurdoch@dartaero.com

11/22/2007

Q.C. COORDINATOR

From: Eric Charbonneau [mailto:echarbonneau@dartaero.com]
Sent: Wednesday, November 14, 2007 3:16 PM
To: David Shepherd
Cc: Jason Murdoch; Leanne Elsliger; Mike Petsche
Subject: tunnel mat'l

Hi David, just to clarify, for some reason some 0.018" thick 304SS got identified at receiving as 0.025", waterjet operator recorded 0.022" on is FAI (depending on how you measure this is possible), the parts were audited by QC and approved by engineering on a prototype w/o, went thru the whole system unnoticed until today. I think there is more than one department at fault in this. If you want to keep 0.025" on the drawings for the tunnel its fine we have 2 sheets in stock, I was just thinking since we already use a lot of 0.018" thick SS we could go with this and prevent this kind of mistake from happening again by standardising our material inventory.

Thanks,

Eric Charbonneau
Production Engineering Coordinator

DART aerospace Ltd.

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.31/1130 - Release Date: 11/14/2007 9:27 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 11/15/2007 9:34 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

11/22/2007

Date: Tuesday, 11/13/2007 2:00:10 PM
 Ser: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: TUNNEL BOTTOM PANEL
Job Number	: 35710		
Estimate Number	: 13026		
P.O. Number	:	Part Number	: D3649041
This Issue	: 11/13/2007 S.O. No. :	Drawing Number	: D3649 UNDER REVIEW
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: / / Type : SMALL /MED FAB	Drawing Revision	: U/R
Previous Run	: 35014	Material	:
Written By	: <u>BE</u>	Due Date	: 11/20/2007 Qty: 1 Um: Each
Checked & Approved By	:		
Comment	: Est Rev:A New Issue 07-09-26 EC verified by: DD		

Additional Product



Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 6.3725 sf(s)/Unit Total : 6.3725 sf(s)
 304/316 SS sheet 24 ga (0.025" thick)

Batch: M105599BE 07-10-09

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3649

Dwg Rev: AProg Rev: ABE 07-10-09

2-Deburr if necessary

BE 07-11-09D

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

BE 07-11-09D

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

BE 07/10/09

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3649

BE 07-11-09 D

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: TUNNEL BOTTOM PANEL

Job Number: 35710

Part Number: D3649041



Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

6.0	QC5	INSPECT WORK TO CURRENT STEP
-----	-----	------------------------------



IE
07-11-23



Comment: INSPECT WORK TO CURRENT STEP

7.0	MS210603K	Nut Plate
-----	-----------	-----------



Comment: Qty.: 22.0000 Each(s)/Unit Total : 22.0000 Each(s)
Nut Plate

M105938

8.0	MS210623K	Nut Plate
-----	-----------	-----------



Comment: Qty.: 22.0000 Each(s)/Unit Total : 22.0000 Each(s)
Nut Plate

M105938

9.0	MS20427M33	Rivet
-----	------------	-------



Comment: Qty.: 88.0000 Each(s)/Unit Total : 88.0000 Each(s)
Rivet

M105728

10.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
------	-------------	-------------------------------



Comment: SMALL & MEDIUM FAB RESOURCE 1

1- Form dimple for MS20427M3 rivet per dwg D3649
*****ensure dimples are on the proper side*****

2- Assemble nut plates as per dwg D3649

07.11.23

11.0	QC5	INSPECT WORK TO CURRENT STEP
------	-----	------------------------------



IE
07-11-23



Comment: INSPECT WORK TO CURRENT STEP

12.0	PACKAGING 1	PACKAGING RESOURCE #1
------	-------------	-----------------------



Comment: PACKAGING RESOURCE #1
Identify and stock
Location: _____

07/11/23 ①

Date: Tuesday, 11/13/2007 2:00:10 PM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: TUNNEL BOTTOM PANEL

POSITIVE
RECALL

Job Number: 35710

Part Number: D3649041

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

D 07.11.27

Job Completion



U 07.11.27

POSITIVE RECALL

EFFECTIVE 07.11.23 AUTH 4

RELEASED _____ DATE _____

8 7 6 5 4 3 2 1

D

D

C

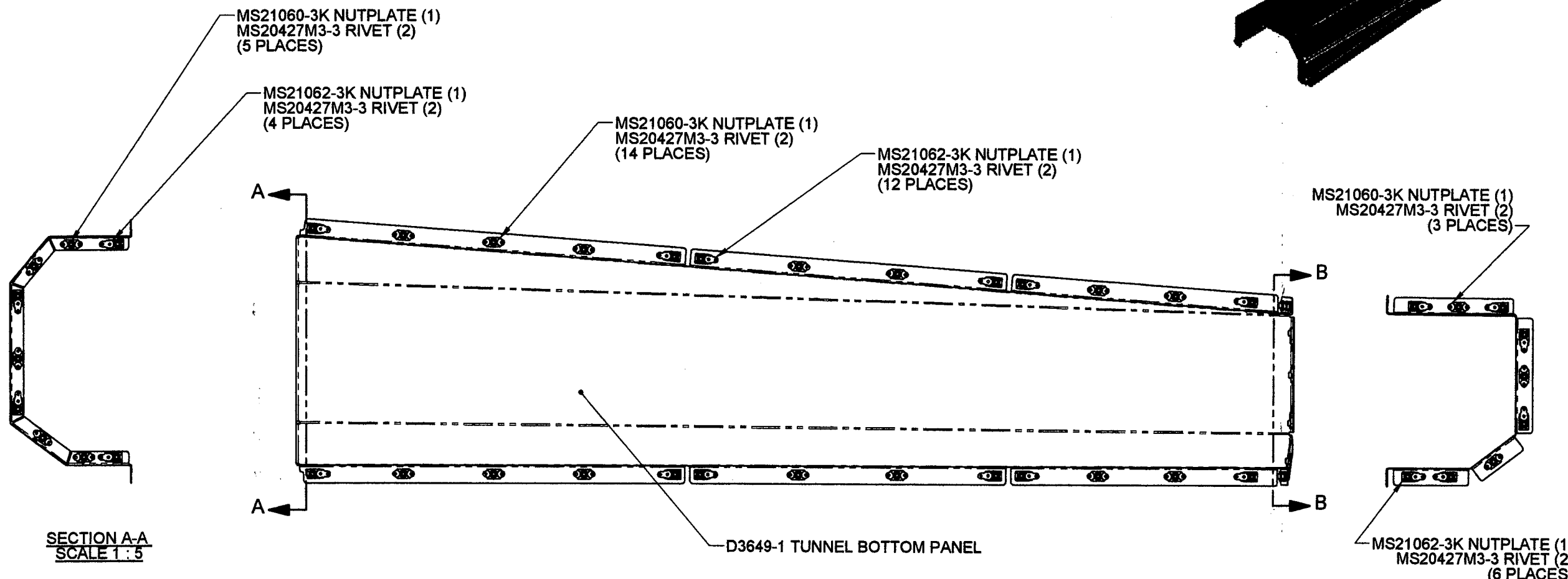
C

B

B

A

A



SECTION A-A
SCALE 1:5

SECTION B-B
SCALE 1:5

D3649-041 TUNNEL BOTTOM PANEL ASSY

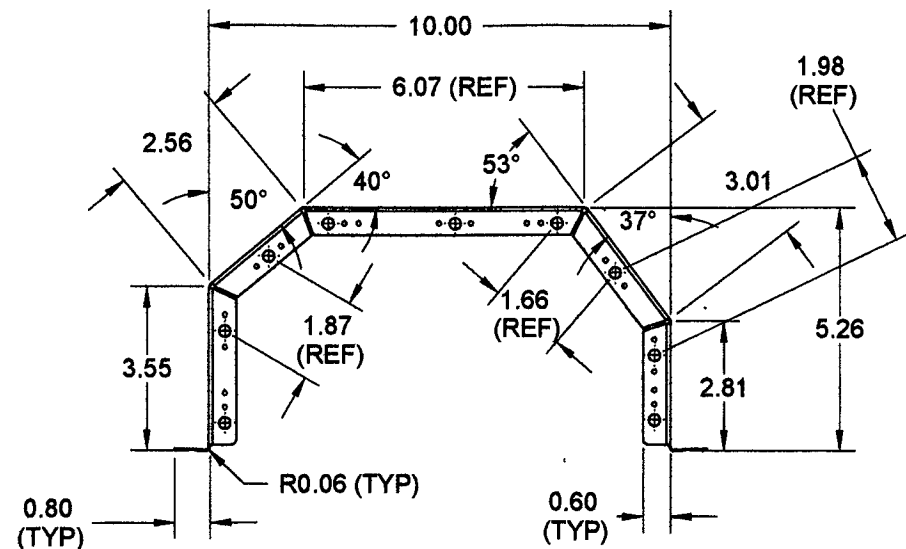
PRELIMINARY ISSUE

PART LIST

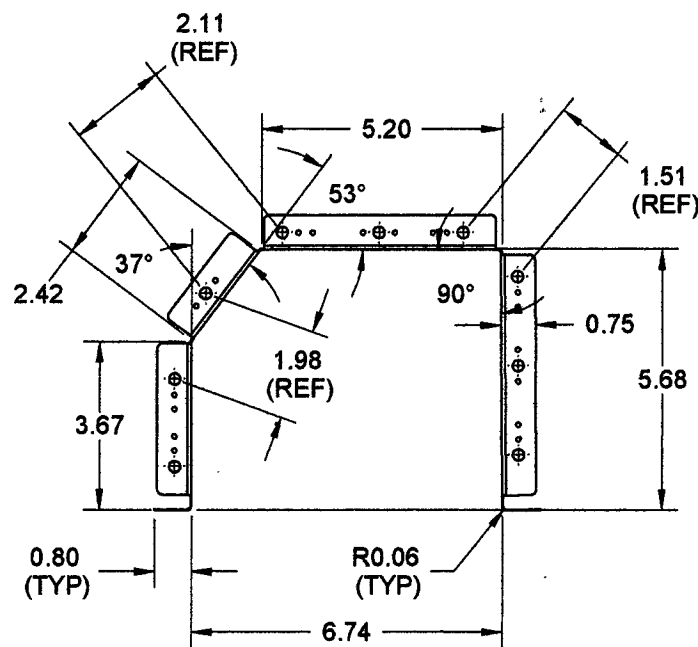
QTY .041	PART NUMBER	DESCRIPTION
X	D3649-041	TUNNEL BOTTOM PANEL ASSY.
1	D3649-1	TUNNEL BOTTOM PANEL
88	MS20427M3-3	RIVET
22	MS21060-3K	NUTPLATE
22	MS21062-3K	NUTPLATE

A	NEW ISSUE	RF	07.11.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3649	SHEET 1 OF 3
APPROVED		TITLE	SCALE
DE APPR.		BOTTOM PANEL ASSEMBLY	1:12
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

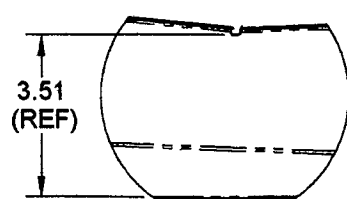
8 7 6 5 4 3 2 1



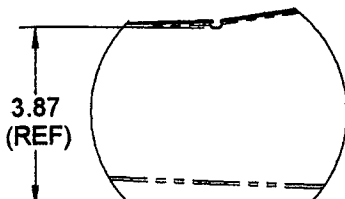
VIEW 'C' D3649-1



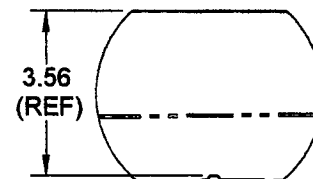
VIEW 'D' D3649-1



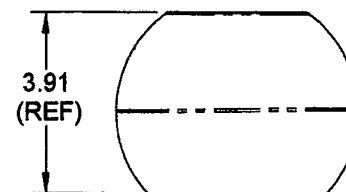
**DETAIL I
SCALE 1:4**



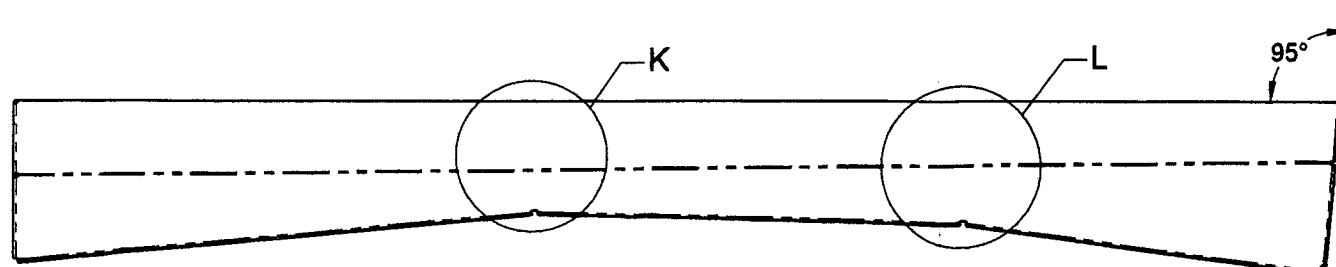
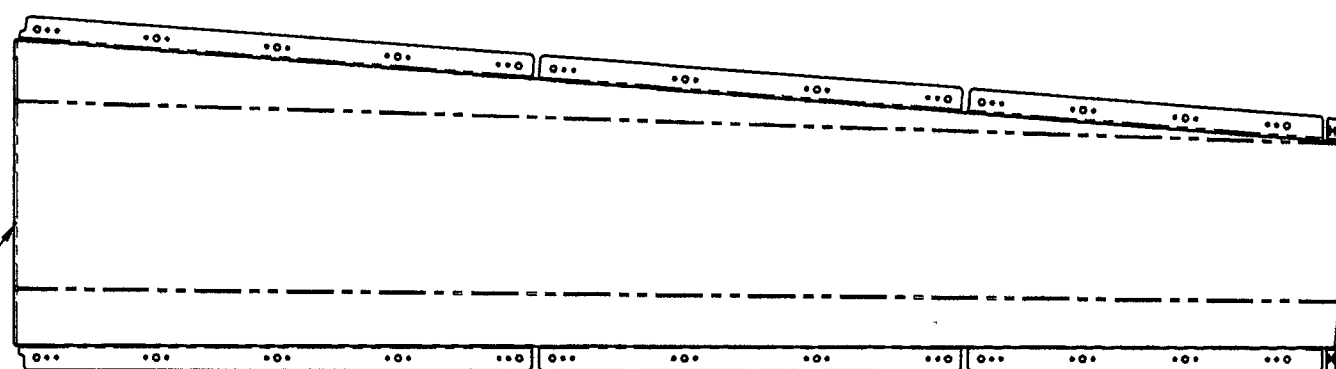
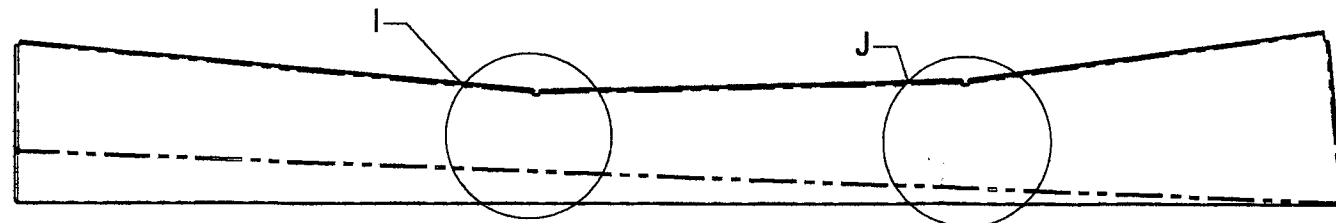
**DETAIL J
SCALE 1:4**



**DETAIL K
SCALE 1:4**



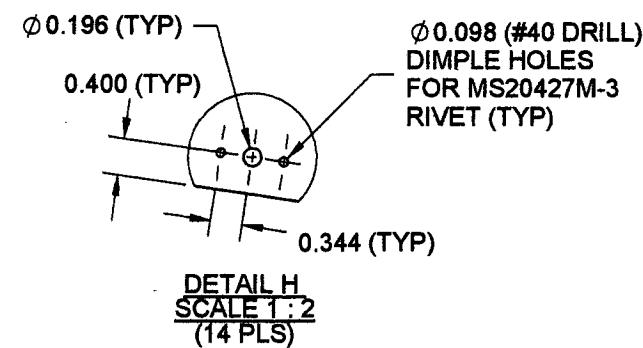
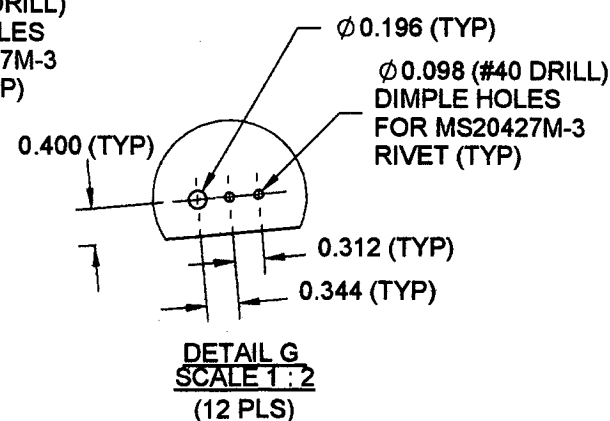
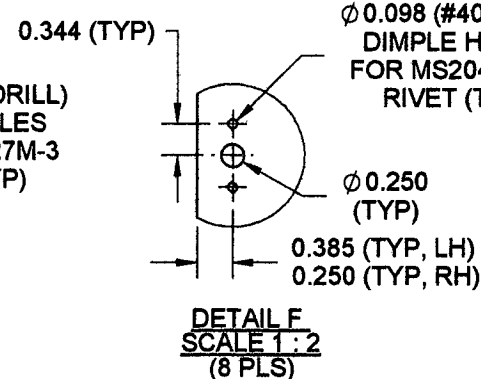
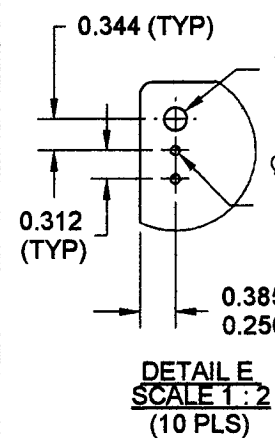
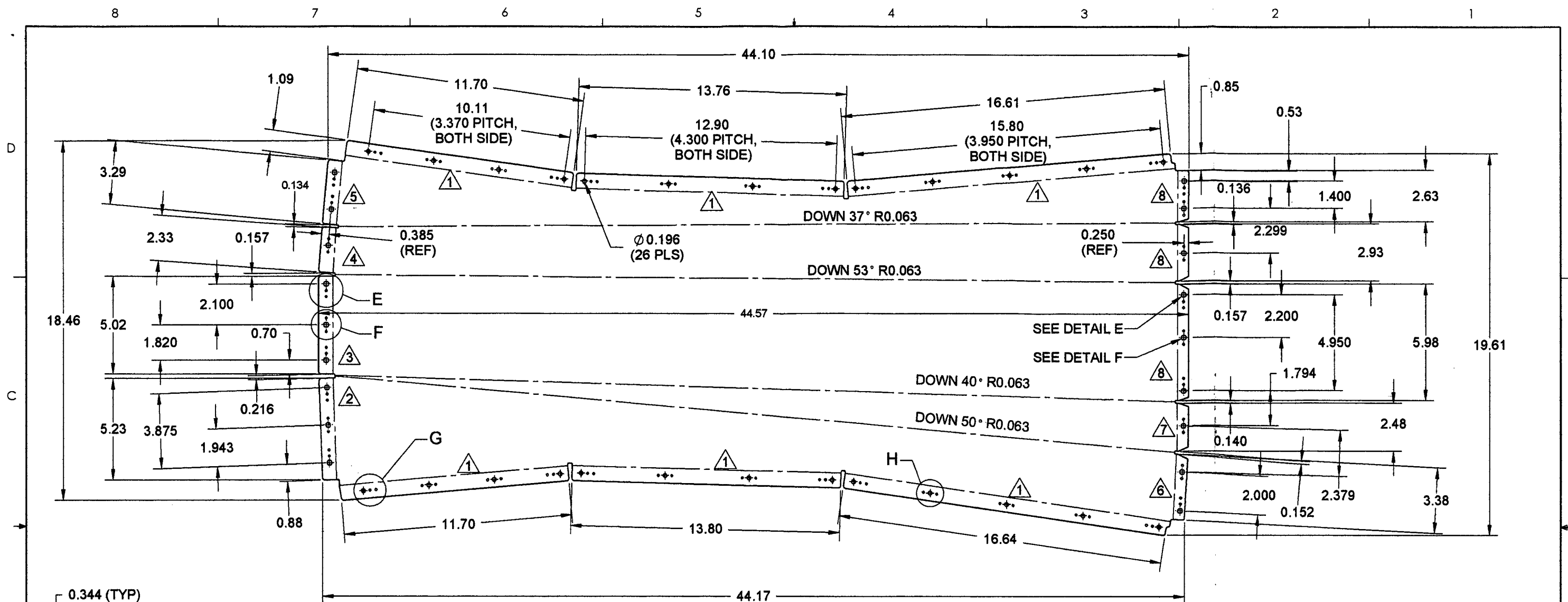
**DETAIL L
SCALE 1:4**



D3649-1 TUNNEL BOTTOM PANEL

PRELIMINARY ISSUE

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3649	SHEET 2 OF 3
APPROVED		TITLE	SCALE
DE APPR.		BOTTOM PANEL ASSEMBLY	1:2
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	



- 1 UP 90° R 0.063
- 2 UP 94° R 0.063
- 3 UP 85° R 0.063
- 4 UP 87° R 0.063
- 5 UP 90° R 0.063
- 6 UP 94° R 0.063
- 7 DOWN 91° R 0.063
- 8 DOWN 90° R 0.063

PRELIMINARY ISSUE

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D3649-1F" USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 4.32 lbs

D3649-1F FLAT PATTERN

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3649	SHEET 3 OF 3
APPROVED		TITLE	SCALE
DE APPR.		BOTTOM PANEL ASSEMBLY	1:12
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

35710

DART AEROSPACE LTD		Work Order: 35710
Description: TUNNEL BOTTOM PANEL		Part Number: D3649-041
Inspection Dwg: 3649	Rev: PRE	Page 1 of 1

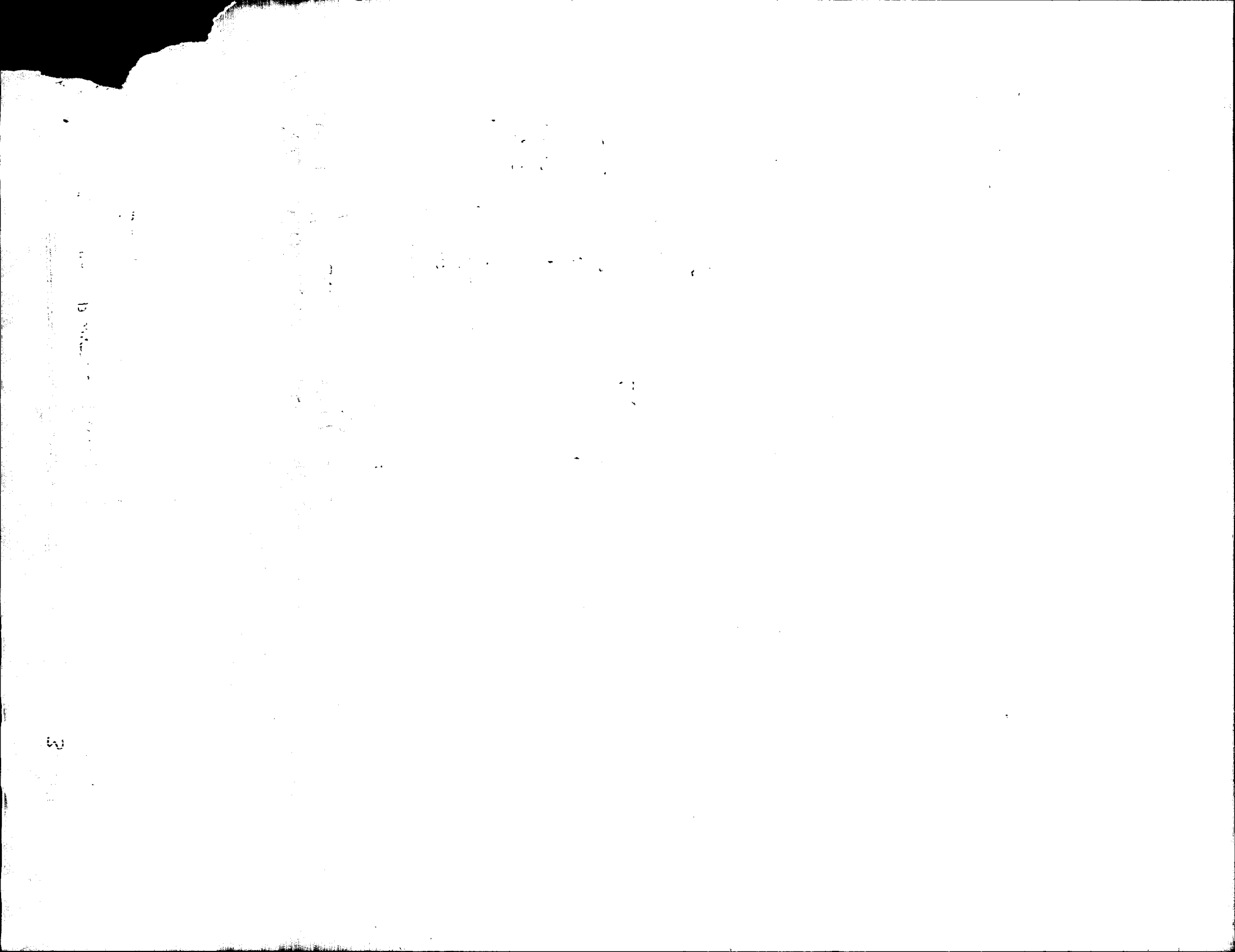
FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø .250	+ .005 - .001	.255	X			
44.17	+/- .030	44.17	X			
44.57	+/- .030	44.57	X			
44.10	+/- .030	44.10	X			
11.70	+/- .030	11.70	X			
13.76	+/- .030	13.76	X			
16.61	+/- .030	16.61	X			
11.70	+/- .030	11.70	X			
13.80	+/- .030	13.80	X			
16.64	+/- .030	16.64	X			
3.29	+/- .030	3.29	X			
2.33	+/- .030	2.33	X			
5.02	+/- .030	5.02	X			
5.23	+/- .030	5.23	X			
18.46	+/- .030	18.46	X			
2.63	+/- .030	2.63	X			
2.93	+/- .030	2.925	X			
5.98	+/- .030	5.98	X			
2.48	+/- .030	2.475	X			
3.38	+/- .030	3.378	X			
19.61	+/- .030	19.61	X			



Measured by: <i>LB</i>	Audited by: <i>ES</i>	Prototype Approval: <i>[Signature]</i>
Date: 07-10-09	Date: 07/10/09	Date: 07-10-10

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



Date: Tuesday, 11/13/2007 2:33:42 PM
 User: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: WELDMENT TOP PANEL	
Job Number	: 35708	Part Number	: D36503	
Estimate Number	: 13029	Drawing Number	: D3650 UNDER REVIEW	
P.O. Number	:	Project Number	: N/A	
This Issue	: 11/13/2007 S.O. No. :	Drawing Revision	: U/R	
Prsht Rev.	: NC	Material	:	
First Issue	: 11/13/2007 Type : SMALL /MED FAB	Due Date	: 11/20/2007	Qty: 1 Um: Each
Previous Run	: 35148			
Written By	: 			
Checked & Approved By	:			
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 1.2023 sf(s)/Unit Total : 1.2023 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 HB 07-11-14

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3650

Dwg Rev: PRE 2

Prog Rev: PRE L

2-Deburr if necessary

HB 07-11-14

HB 07-11-14

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



HB 07-11-14

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

HB 07-11-20

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3650

HB 07-11-22

Date: Tuesday, 11/13/2007 2:33:42 PM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: WELDMENT TOP PANEL

Job Number: 35708

Part Number: D36503

Job Number:



Seq. #: Machine Or Operation: Description :

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Handwritten: C Jul 23 (AL)

7.0

D365011

FILLER PLATE



Comment: Qty.: 1.0000 (s)/Unit Total : 1.0000 (s)
FILLER PLATE
batch: _____

8.0

LARGE FAB 1

LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1
Weld D3650-11 filler cap as per dwg D3650

Handwritten: J.J.L. 07-11-23

9.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

Handwritten: PD 07-11-24

10.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1
Identify and stock
Location: _____

Handwritten: 07/11/23 (1)

11.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Handwritten: 07-11-14

Job Completion

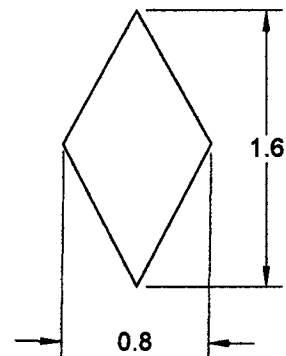
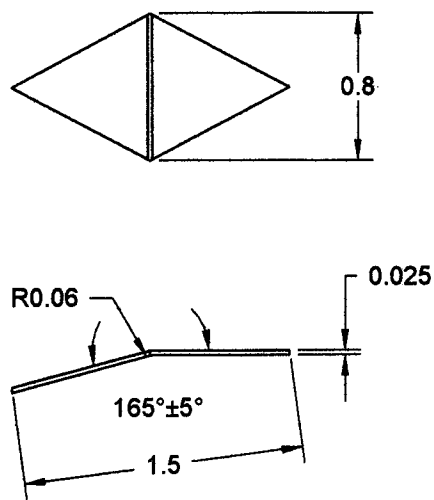
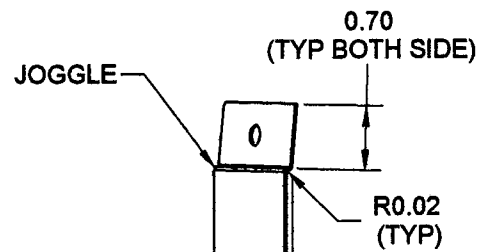


Handwritten: 07-11-27

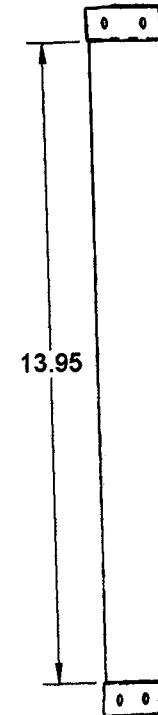
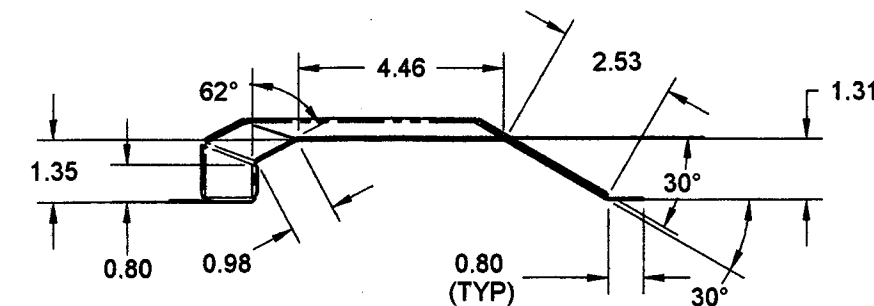
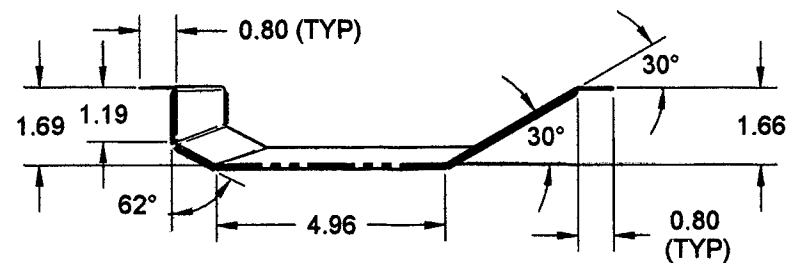
Handwritten: ADD 10 a
10 b
10 c

Handwritten: SEE ATTACHED
07-11-23

POSITIVE RECALL
EFFECTIVE *07-11-14* AUTH *[Signature]*
RELEASED _____ DATE _____



CUT AND WELD
D3650-11
BEND PLATE
AS SHOWN



PRELIMINARY ISSUE

PART LIST

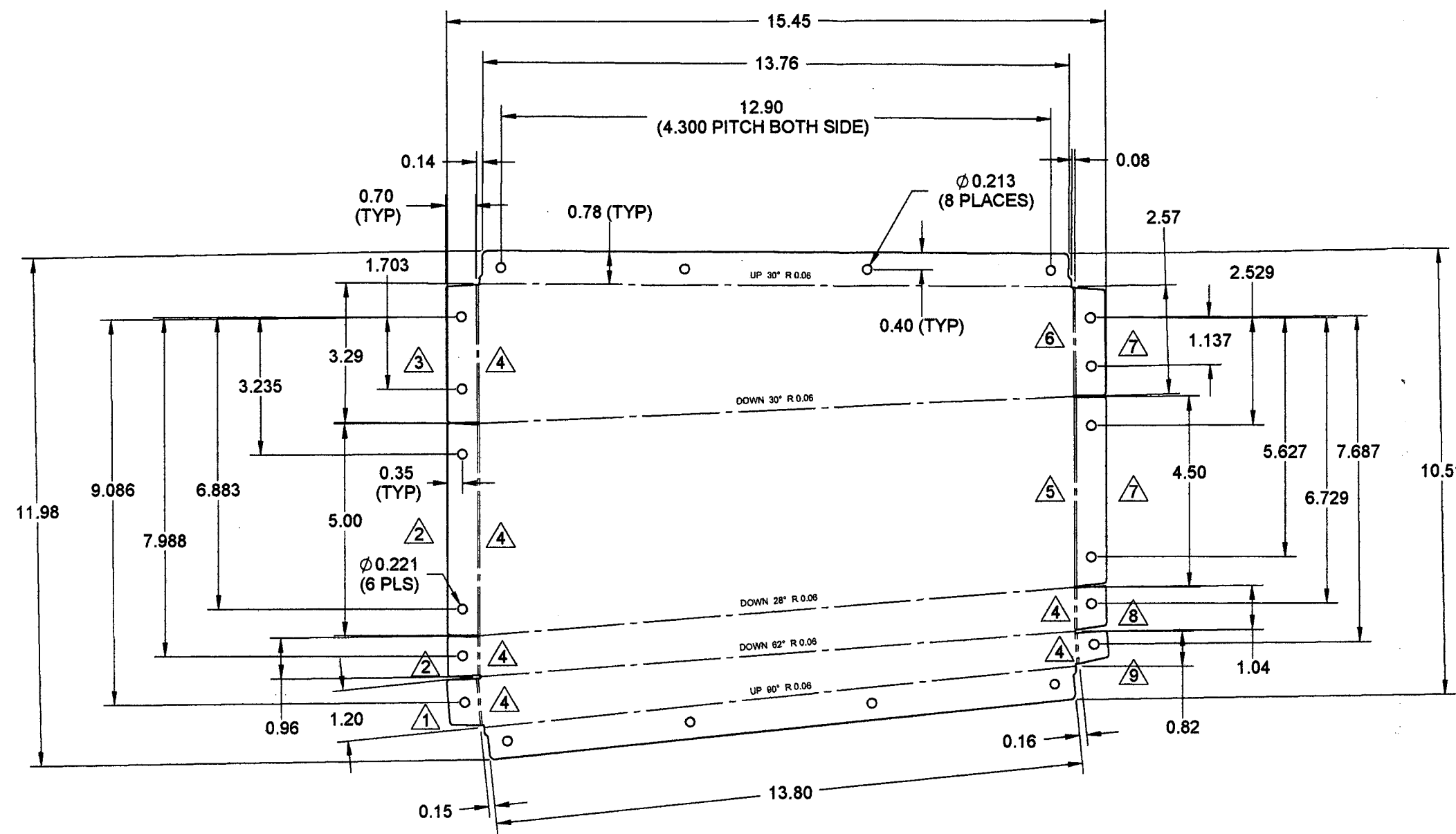
QTY	PART NUMBER	DESCRIPTION
3		
X	D3650-3	CENTER PANEL
1	D3650-11	FILLER PLATE

D3650-3/011 NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) WELD PER DART QSI 004
- 4) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) UNITS: INCHES UNLESS OTHERWISE NOTED
- 6) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 7) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-3 USING FINE POINT PERMANENT INK MARKER
- 8) WEIGHT: D3650-3 (1.0 lbs)

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	
CHECKED		DRAWING NO. REV. A
MFG. APPR.		D3650 SHEET 4 OF 8
APPROVED		TITLE SCALE
DE APPR.		TOP PANEL ASSEMBLY 1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

100-100000



PRELIMINARY ISSUE

- 1 DOWN 92° R 0.015
- 2 DOWN 89° R 0.015
- 3 DOWN 86° R 0.015
- 4 UP 90° R 0.015
- 5 UP 88° R 0.015
- 6 UP 90° R 0.015
- 7 DOWN 88° R 0.015
- 8 DOWN 90° R 0.015
- 9 DOWN 94° R 0.015

D3650-3F CENTER PANEL

NOTES:
 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
 2) FINISH: NONE
 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-3 USING FINE POINT PERMANENT INK MARKER

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3650	SHEET 5 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/23	# 1.0	wrong mat. thickness was used. 0.018" instead of 0.025"	LE 07.11.23	mat. thickness is acceptable this one time only	07.11.23 LE	✓ 07/11/23	LE 07.11.23	✓ 07/11/23

NOTE: Date & initial all entries

W/o 35708

✓ Step 10a

07.11.23 Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

07/11/23 D

✓ Step 10b



07.11.23 QC5 (Upon receipt of STC)

✓ Step 10c

07.11.23 Remove positive recall and release part to Eagle Copters

Date: Tuesday, 11/13/2007 4:03:53 PM
Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: WELDMENT TOP PANEL	
Job Number	: 35709	Part Number	: D36505	
Estimate Number	: 13030	Drawing Number	: D3650 UNDER REVIEW	
P.O. Number	:	Project Number	: N/A	
This Issue	: 11/13/2007 S.O. No. :	Drawing Revision	: U/R	
Prsht Rev.	: NC	Material	:	
First Issue	: 11/13/2007 Type : SMALL /MED FAB	Due Date	: 11/20/2007	Qty: 1 Um: Each
Previous Run	: 35149			
Written By	: 			
Checked & Approved By	:			
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

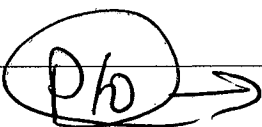
1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 0.8537 sf(s)/Unit Total : 0.8537 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 AB 07-11-14


Last page

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3650

Dwg Rev: PRE-L AB 07-11-14

Prog Rev: PRE-L

2-Deburr if necessary AB 07-11-14

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3650

AB 07-11-20



Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: WELDMENT TOP PANEL

Job Number: 35709

Part Number: D36505

Job Number:



Seq. #: Machine Or Operation: Description :

6.0 QC5 INSPECT WORK TO CURRENT STEP



VE 07.10.23



Comment: INSPECT WORK TO CURRENT STEP

7.0 D36507 SEAL



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

SEAL

batch:

cut one by hand mat: 8168-1 M106312
7 inches

8.0 D36509 ANGLE



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

ANGLE

batch: B35015

9.0 AN960C4 WASHER



Comment: Qty.: 12.0000 Each(s)/Unit Total : 12.0000 Each(s)

WASHER

batch:

PTO
Last Png

10.0 CR3523403 RIVET



Comment: Qty.: 12.0000 (s)/Unit Total : 12.0000 (s)

RIVET

batch: M106303

11.0 MS20427M33 Rivet



Comment: Qty.: 12.0000 Each(s)/Unit Total : 12.0000 Each(s)

Rivet

batch: M105728

12.0 MS210603K Nut Plate



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut Plate

batch: M105938

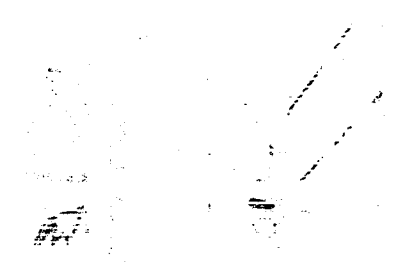
10 10

10 10

10 10

10 10

10 10



10 10

10 10

10 10

10 10

10 10

Date: Tuesday, 11/13/2007 4:03:53 PM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: WELDMENT TOP PANEL

Job Number: 35709

Part Number: D36505

Job Number:



Seq. #:

Machine Or Operation:

Description :

13.0

MS210623K

Nut Plate



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Nut Plate

batch: M105938

14.0

SMALL FAB 1

SMALL & MEDIUM FAB RESOURCE 1



Comment: SMALL & MEDIUM FAB RESOURCE 1

assemble as per dwg D3650

07-11-23 ①

15.0

QC5

INSPECT WORK TO CURRENT STEP



07-11-23

Comment: INSPECT WORK TO CURRENT STEP

16.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

07-11-23 ①

17.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07-11-23 ①
07-11-23

Job Completion



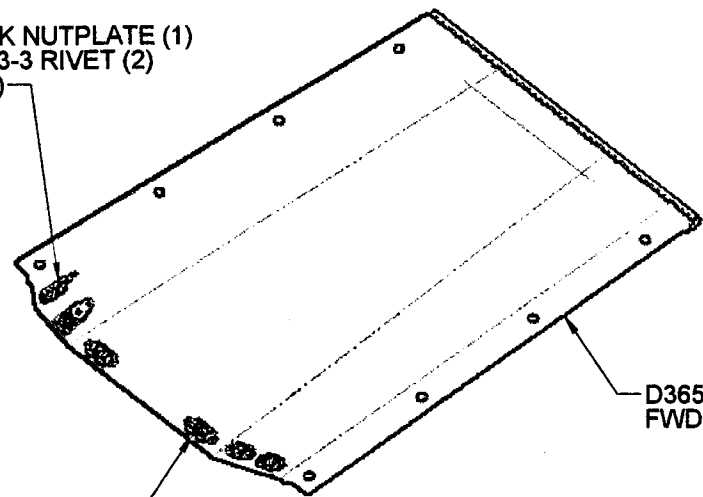
POSITIVE RECALL

EFFECTIVE 07-11-14 AUTH W

RELEASED _____ DATE _____

SEE ATTACHED STEPS 16g
16b
16c

07-11-22

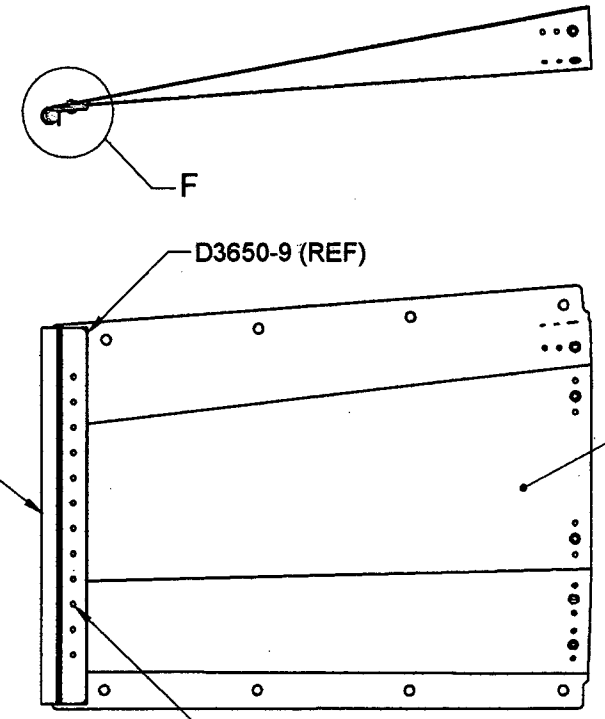
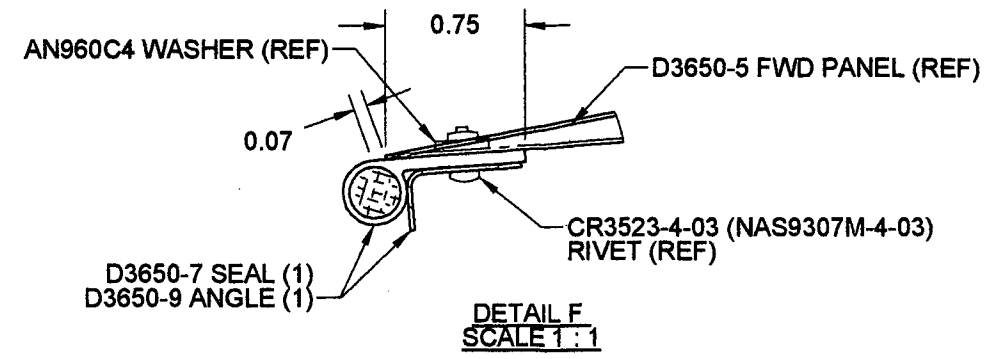


PRELIMINARY ISSUE

PART LIST

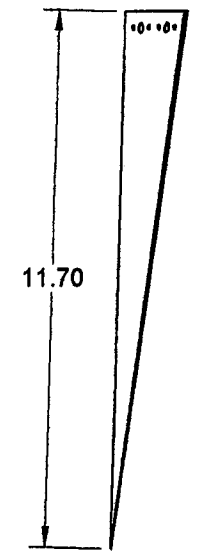
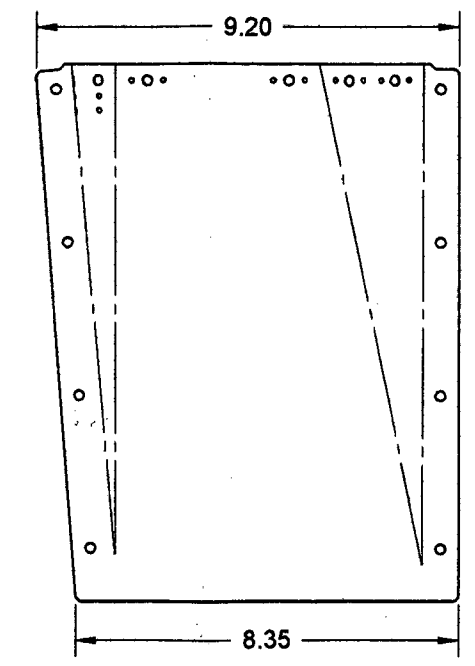
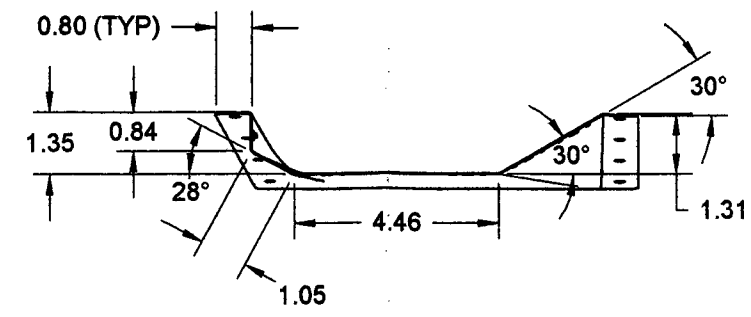
QTY -5	PART NUMBER	DESCRIPTION
X	D3650-5	FWD PANEL
1	D3650-7	SEAL
1	D3650-9	ANGLE
12	AN960C4	WASHER
12	CR3523-4-03 or NAS9307M-4-03	RIVET
12	MS20427M3-3	RIVET
4	MS21060-3K	NUTPLATE
2	MS21062-3K	NUT PLATE

- NOTES:
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-3 USING FINE POINT PERMANENT INK MARKER
 - 7) WEIGHT: 0.8 lbs



D3650-5 FWD PANEL

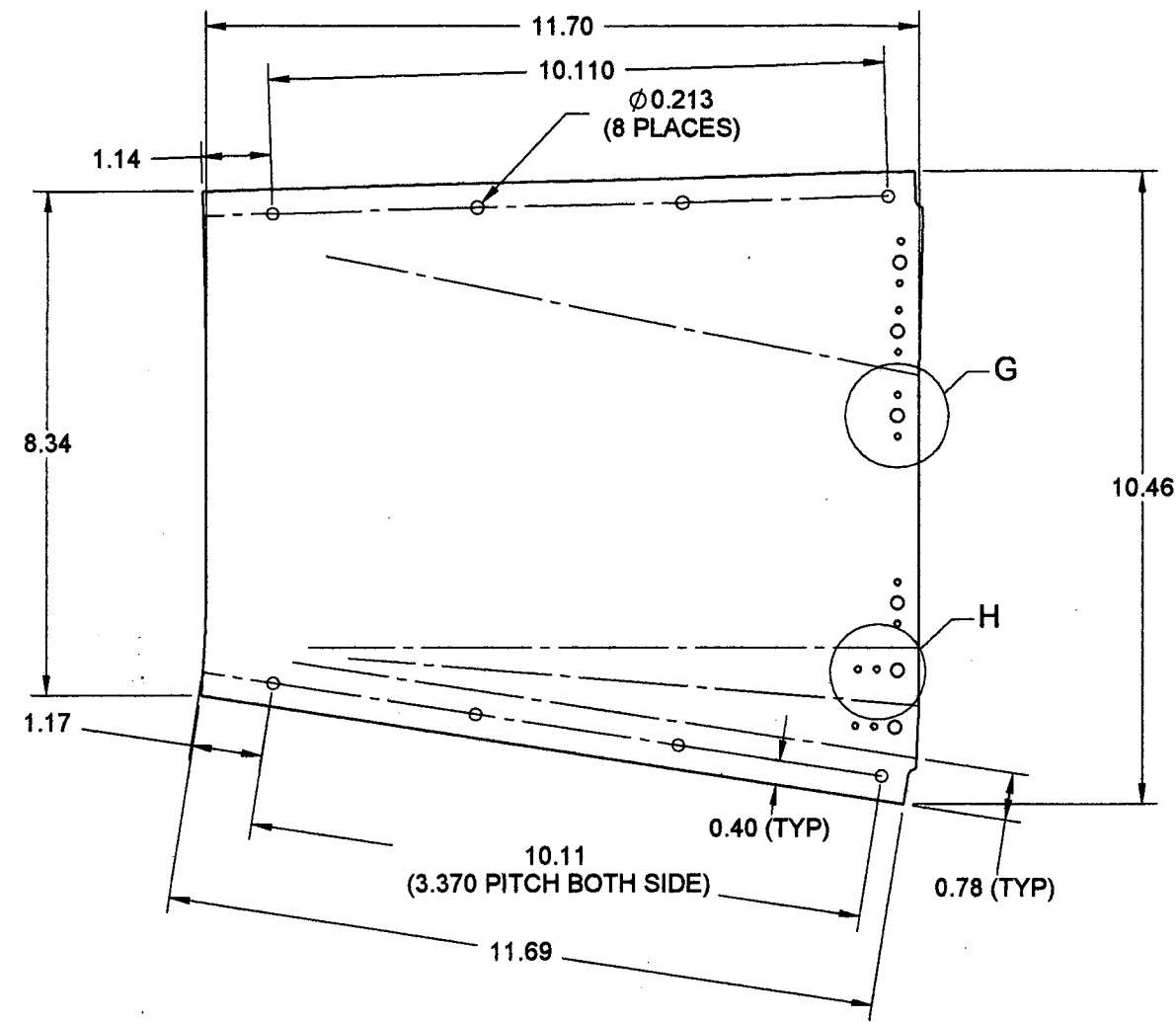
CENTRE D3650-7/-9 INTO D3650-5 & TRANSFER $\phi 0.129$ (#30 DRILL) HOLES FROM D3650-9 TO D3650-7 & D3650-5 AS SHOWN
INSTALL
CR3523-4-03 (NAS9307M-4-03) RIVET (1)
AN960C4 WASHER (1)
(12 PLACES)



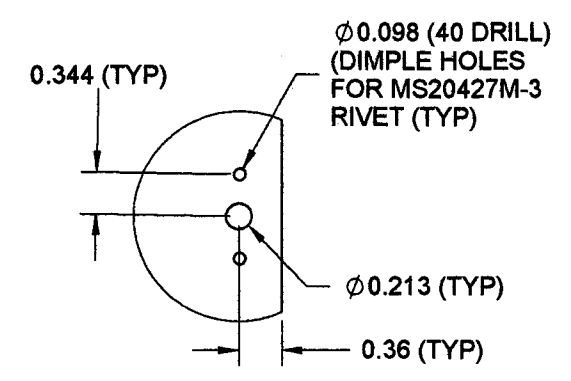
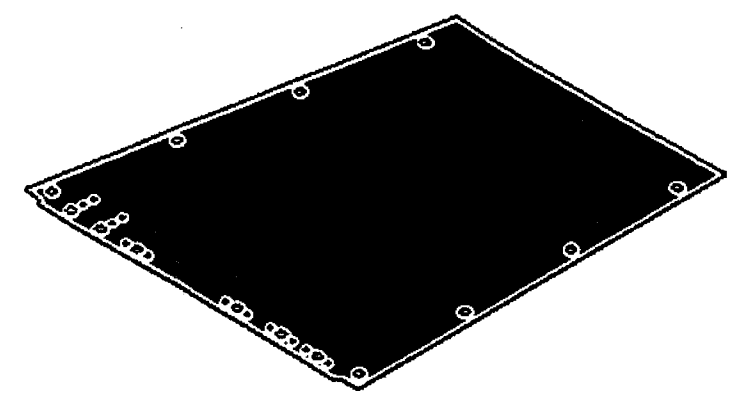
D3650-5 FWD PANEL BEND DETAIL
(MAKE FROM D3650-5F FLAT PATTERN)

PRELIMINARY ISSUE

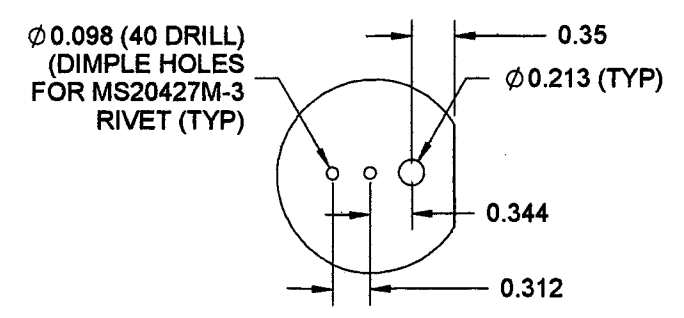
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO. D3650	REV. A
MFG. APPR.			SHEET 6 OF 8
APPROVED		TITLE TOP PANEL ASSEMBLY	SCALE 1:4
DE APPR.		COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	07.11.07		



D3650-5F FLAT PATTERN



**DETAIL G
SCALE 2:3**



**DETAIL H
SCALE 2:3**

PRELIMINARY ISSUE

- NOTES:**
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-5 USING FINE POINT PERMANENT INK MARKER

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3650	SHEET 7 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/o 35709

16 Step 16a

07.11.22 Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CL07111/23

16 Step 16b

07.11.22 QC5 (Upon receipt of STC)

16 Step 16c

07.11.22 Remove positive recall and release part to Eagle Copters

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: 20 Date: 07/11/27
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/22	#1.0	wrong mat. was used 0.018" instead of 0.025" thick.	LE 07.11.22	mat. thickness is acceptable this one time only	LE 07.11.22 07.11.23	07/11/22	LE 07.11.22	07/11/22
07.11.23	9.0	AN960C4 washers UNavailable.	LE 07.11.23	see attached email Use M304522GA cut to 0.45" x 6.6" and transfer drill from assembly	LE 07.11.23	07.11.23	LE 07.11.23	07/11/23
				M 105262				

NOTE: Date & initial all entries

Jason Murdoch

From: Susanne Sheldon [ssheldon@dartaero.com]
Sent: Thursday, November 15, 2007 2:37 PM
To: 'L Lacelle'; 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Dale is opening a corrective action to add a gauge thickness chart to QSI003 - Metal fabrication. We will also review the receiving/inspection procedure for marking the sheet metal, the thickness tolerances on sheet metal and the tolerances on the measuring instruments used. All input is welcome.
 Susanne

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: November 15, 2007 2:12 PM
To: 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

COMPLETELY agree!!

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: November 15, 2007 1:41 PM
To: 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Hello all,

Just to confirm ... 0.018" is good for me ... whatever works for production ... minimum requirement is 0.015".

I think Jason's suggestion to add a gauge thickness chart to a QSI is a good idea.
 The confusing thing is that it varies between stainless and carbon steel.
 Maybe not QSI 017 or 018 ... perhaps the Sheet Metal Fabrication QSI.

David

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: Wednesday, November 14, 2007 3:11 PM
To: 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Also what becomes an issue, is that the material is being identified in gauge instead of in inches. This causes workers to pull 25ga material instead of 0.025", for example. Keep in mind, workers are SUPPOSED to verify the thickness of the material before use. The use of gauge is not mentioned in QSI 017 or QSI 018 (QSI 018 does mention " dimensions are in inches " see section 4.1). If the use of gauge will continue, I find it necessary that we should have this included in the QSI, with a chart of gauge converted into inches, along with a tolerance, for each material that we use, since each is different, and approved by engineering.

jmurdoch@dartaero.com

11/22/2007

Q.C. COORDINATOR

From: Eric Charbonneau [mailto:echarbonneau@dartaero.com]
Sent: Wednesday, November 14, 2007 3:16 PM
To: David Shepherd
Cc: Jason Murdoch; Leanne Elsliger; Mike Petsche
Subject: tunnel mat'l

Hi David, just to clarify, for some reason some 0.018" thick 304SS got identified at receiving as 0.025", waterjet operator recorded 0.022" on is FAI (depending on how you measure this is possible), the parts were audited by QC and approved by engineering on a prototype w/o, went thru the whole system unnoticed until today. I think there is more than one department at fault in this. If you want to keep 0.025" on the drawings for the tunnel its fine we have 2 sheets in stock, I was just thinking since we already use a lot of 0.018" thick SS we could go with this and prevent this kind of mistake from happening again by standardising our material inventory.

Thanks,

Eric Charbonneau
Production Engineering Coordinator

DART aerospace Ltd.

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.31/1130 - Release Date: 11/14/2007 9:27 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 11/15/2007 9:34 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

No virus found in this outgoing message.


Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

11/22/2007

Date: Monday, 11/19/2007 9:55:54 AM
 User: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: AFT BASE ASS'Y
Job Number	: 35850		
Estimate Number	: 13043		
P.O. Number	:	Part Number	: D3651041
This Issue	: 11/19/2007 S.O. No. :	Drawing Number	: D3651 UNDER REVIEW
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: / / Type : SMALL /MED FAB	Drawing Revision	: U/R
Previous Run	: 35017	Material	:
Written By	: 	Due Date	: 11/26/2007 Qty: 1 Um: Each
Checked & Approved By	:		
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC		



Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1
 Pick Packing Kit

2.0	D3651043	FLANGE ASSEMBLY
-----	----------	-----------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 FLANGE ASSEMBLY

B35846

B 07.11.23

3.0	D36511	GASKET
-----	--------	--------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 GASKET

B35844

4.0	D36519	DOUBLER
-----	--------	---------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 DOUBLER

B35847

5.0	D365111	GASKET
-----	---------	--------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 GASKET

B35848

Date: Monday, 11/19/2007 9:55:54 AM
User: , Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE ASS'Y

Job Number: 35850

Part Number: D3651041

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

6.0	D365113	DOUBLER
-----	---------	---------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
DOUBLER

B35849

7.0	CR3523402	RIVET
-----	-----------	-------



Comment: Qty.: 58.0000 Each(s)/Unit Total : 58.0000 Each(s)
RIVET

M106302

8.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
-----	-------------	-------------------------------



Comment: SMALL & MEDIUM FAB RESOURCE 1

07.11.23

9.0	QC5	INSPECT WORK TO CURRENT STEP
-----	-----	------------------------------



Comment: INSPECT WORK TO CURRENT STEP

07.11.23

10.0	PACKAGING 1	PACKAGING RESOURCE #1
------	-------------	-----------------------



Comment: PACKAGING RESOURCE #1

07/11/23

11.0	QC21	FINAL INSPECTION/W/O RELEASE
------	------	------------------------------



Comment: FINAL INSPECTION/W/O RELEASE

07/11/19

Job Completion



07.11.27

POSITIVE RECALL

EFFECTIVE 11.11.19 AUTH

RELEASED DATE

ADD STDS

10 a
10 b

10 c

See attached
07.11.23

8

7

6

5

4

3

2

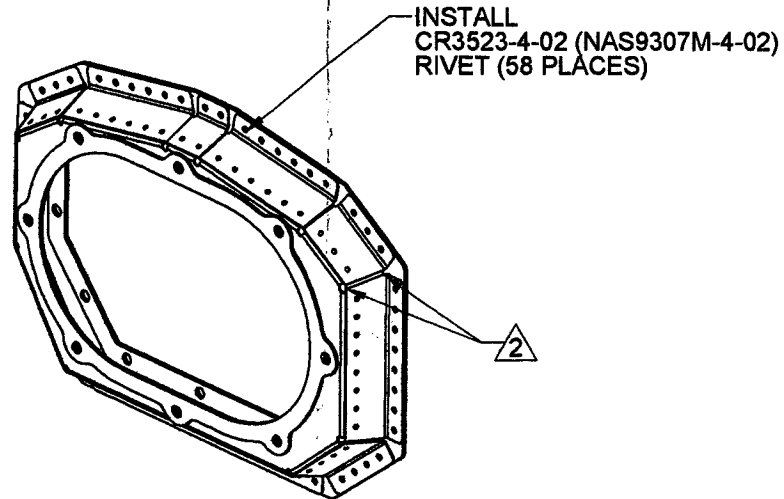
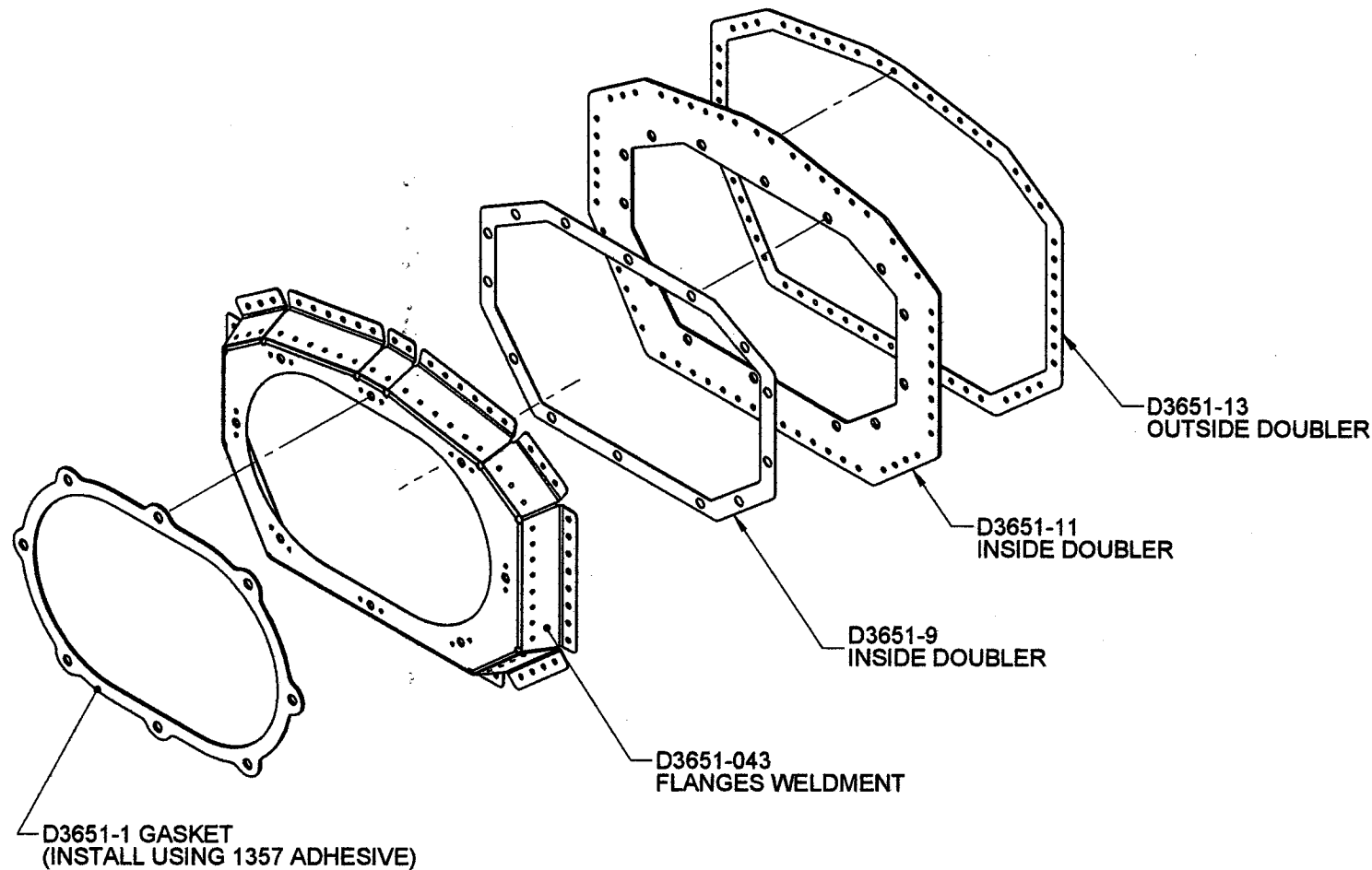
1

D

C

B

A



PART LIST

QTY -041	PART NUMBER	DESCRIPTION
X	D3651-041	AFT BASE ASSEMBLY ASSY.
1	D3651-043	FLANGES WELDMENT
1	D3651-1	GASKET
1	D3651-9	INSIDE DOUBLER
1	D3651-11	GASKET
1	D3651-13	OUTSIDE DOUBLER
58	CR3523-4-02 or NAS9307M-4-02	RIVET

D3651-041 AFT BASE ASSEMBLY

D3651-041 NOTES:

- 1) SEAL GAPS USING 3M HIGH PERFORMANCE CONTACT ADHESIVE 1357
- 2) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 3) UNITS: INCHES UNLESS OTHERWISE NOTED
- 4) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 5) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-041 USING FINE POINT PERMANENT INK MARKER
- 6) WEIGHT: 1.62 lbs

A	NEW ISSUE	RF	07.11.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 1 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/ O 35850

UE
07-11-23 Step 10a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CL 07/11/23 ①

UE
07-11-23 Step 10b


QC5 (Upon receipt of STC)

UE
07-11-23 Step 10c

Remove positive recall and release part to Eagle Copters

Date: Monday, 11/19/2007 9:25:06 AM
 User: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: FLANGE ASSY
Job Number	: 35846		
Estimate Number	: 13032		
P.O. Number	:	Part Number	: D3651043
This Issue	: 11/19/2007 S.O. No. :	Drawing Number	: D3651 UNDER REVIEW
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: / / Type : SMALL /MED FAB	Drawing Revision	: U/R
Previous Run	: 35018	Material	:
Written By	: 	Due Date	: 11/26/2007 Qty: 1 Um: Each
Checked & Approved By	:		
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC		



Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 0.2573 sf(s)/Unit Total : 0.2573 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 165592 HB 07-11-19

(FOR D3651-7)

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3651 (D3651-7)

Dwg Rev: PRE 2 HB 07-11-19

Prog Rev: PRE L

(2)

2-Deburr if necessary

IDENTIFY AS D3651-7 HB 07-11-19

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



HB 07-11-19



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

HB 07-11-19 (2)

Date: Monday, 11/19/2007 9:25:06 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FLANGE ASSY

Job Number: 35846

Part Number: D3651043

Job Number:



POSITIVE
RECALL

Seq. #: Machine Or Operation: Description :

5.0 M304S24GA 304/316 .025 Sheet



Comment: Qty.: 0.2573 sf(s)/Unit Total : 0.2573 sf(s)
304/316 SS sheet 24 ga (0.025" thick)
Batch: 165595

HB 07-11-14

(FOR D3651-5)

6.0 WATER JET FLOW WATER JET



Comment: FLOW WATER JET
1-Cut as per Dwg D3651 (D3651-5)
Dwg Rev: PRE L
Prog Rev: PRE L

HB 07-11-14

2-Deburr if necessary
Identify as D3651-5

7.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



HB 07-11-14

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

8.0 QC8 SECOND CHECK



Comment: SECOND CHECK

HB 07.11-22 (1)

9.0 BRAKE NC NC BRAKE



Comment: NC BRAKE
Form D3651-5 and D3651-7 as per Dwg D3651

HB 07.11-22 (1)

10.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07/14/23 (21)

11.0 LARGE FAB 1 LARGE FABRICATION RESOURCE 1



Comment: LARGE FABRICATION RESOURCE 1
Weld assembly as per dwg D3651

J.S.L. 07/11/23

Date: Monday, 11/19/2007 9:25:06 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FLANGE ASSY

Job Number: 35846

Part Number: D3651043



Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

12.0	QC9	VISUAL WELDING INSPECTION
------	-----	---------------------------



Comment: VISUAL WELDING INSPECTION

D 07.11.24

13.0	QC5	INSPECT WORK TO CURRENT STEP
------	-----	------------------------------



VE 07.11.23



Comment: INSPECT WORK TO CURRENT STEP

14.0	D36513	BASE
------	--------	------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
BASE

B 35845

15.0	MS20427M33	Rivet
------	------------	-------



Comment: Qty.: 16.0000 Each(s)/Unit Total : 16.0000 Each(s)
Rivet

M105728

16.0	MS210603K	Nut Plate
------	-----------	-----------



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)
Nut Plate

M105938

17.0	CR3523401	RIVET
------	-----------	-------



Comment: Qty.: 57.0000 Each(s)/Unit Total : 57.0000 Each(s)
RIVET

(PTO)

M106302

18.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
------	-------------	-------------------------------



Comment: SMALL & MEDIUM FAB RESOURCE 1
Assemble as per dwg D3651

07.11.23

19.0	QC5	INSPECT WORK TO CURRENT STEP
------	-----	------------------------------



VE 07.11.23



Comment: INSPECT WORK TO CURRENT STEP

Date: Monday, 11/19/2007 9:25:06 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FLANGE ASSY

Job Number: 35846

Part Number: D3651043

Job Number:



Seq. #:

Machine Or Operation:

Description :

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

C207/11/26 ①

21.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

D07-11-07

U 07.11.24

Job Completion



POSITIVE RECALL

EFFECTIVE 07.11.19 AUTH h

RELEASED _____ DATE _____

ADD

20a

20b

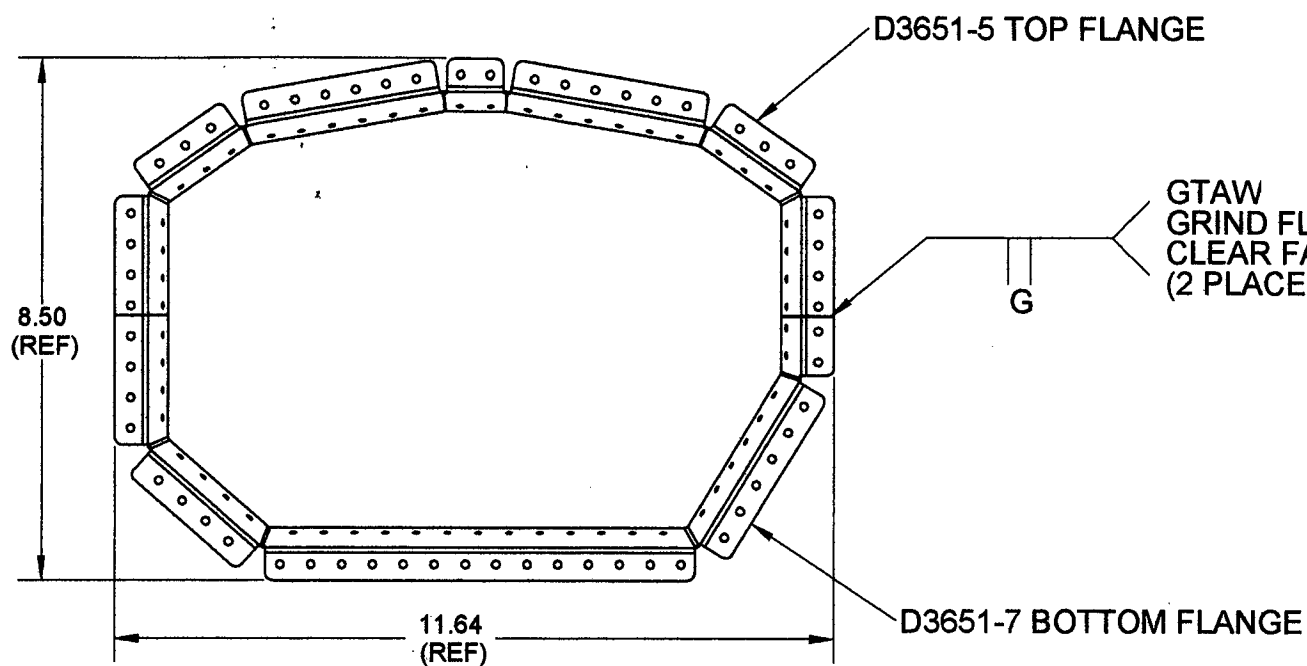
20c

SEE ATTACHED

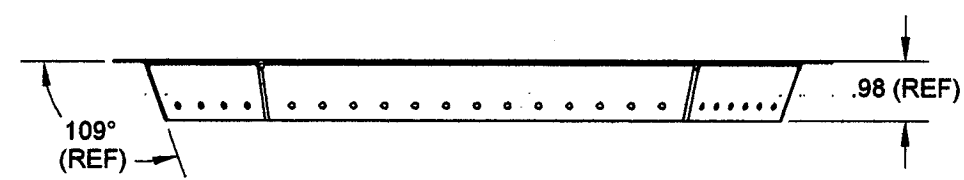
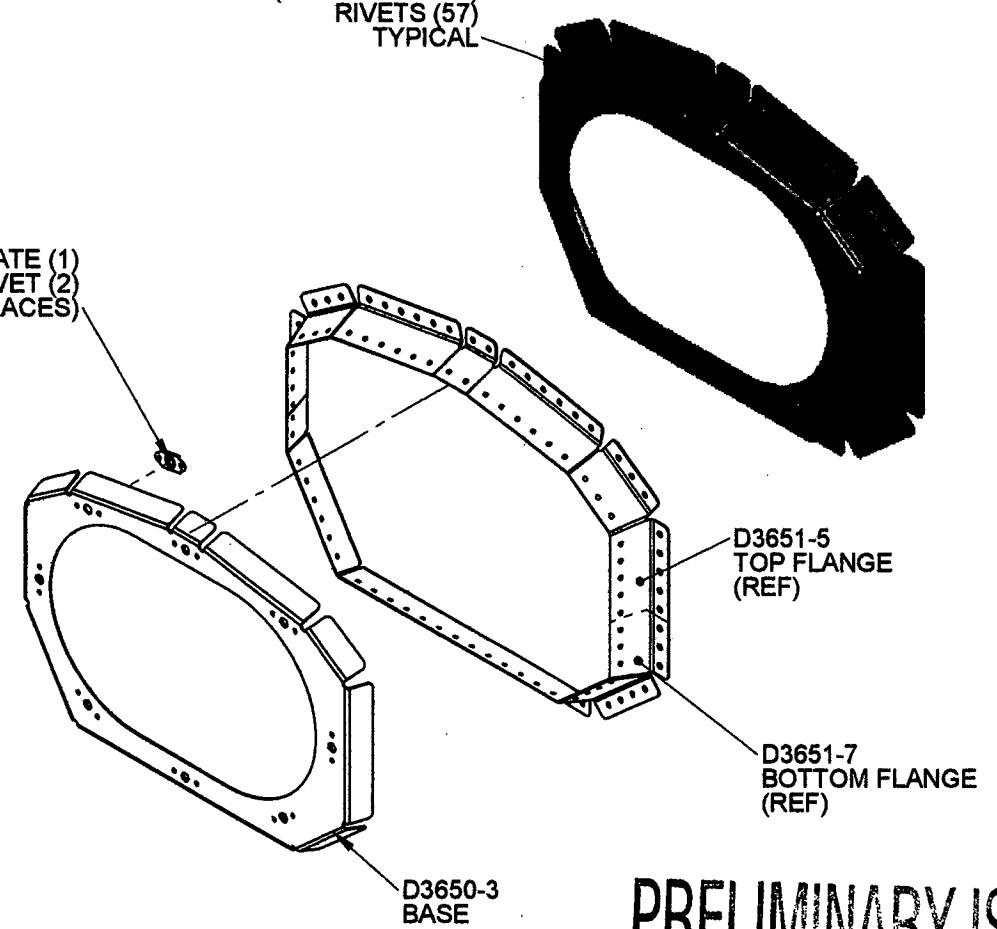
VE 07/11/23

8 7 6 5 4 3 2 1

TRANSFER DRILL ϕ 0.129 (#30 DRILL)
INSTALL CR3523-4-01 (NAS9307M-4-01)
RIVETS (57)
TYPICAL



MS21060-3K NUTPLATE (1)
MS20427M3-3 RIVET (2)
(8 PLACES)



D3651-043 WELD DETAIL

D3651-043 FLANGES WELDMENT

PART LIST

QTY -043	PART NUMBER	DESCRIPTION
X	D3651-043	FLANGES WELDMENT
1	D3651-3	BASE
1	D3651-5	TOP FLANGE
1	D3651-7	BOTTOM FLANGE
16	MS20427M3-3	RIVET
8	MS21060-3K	NUTPLATE
57	CR3523-4-01 or NA9307M-4-01	RIVET

NOTES:

- 1) WELD PER QSI 004
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-043 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.76 lbs

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO. D3651	REV. A
MFG. APPR.			SHEET 2 OF 9
APPROVED		TITLE AFT BASE ASSEMBLY	SCALE 1:2
DE APPR.			
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

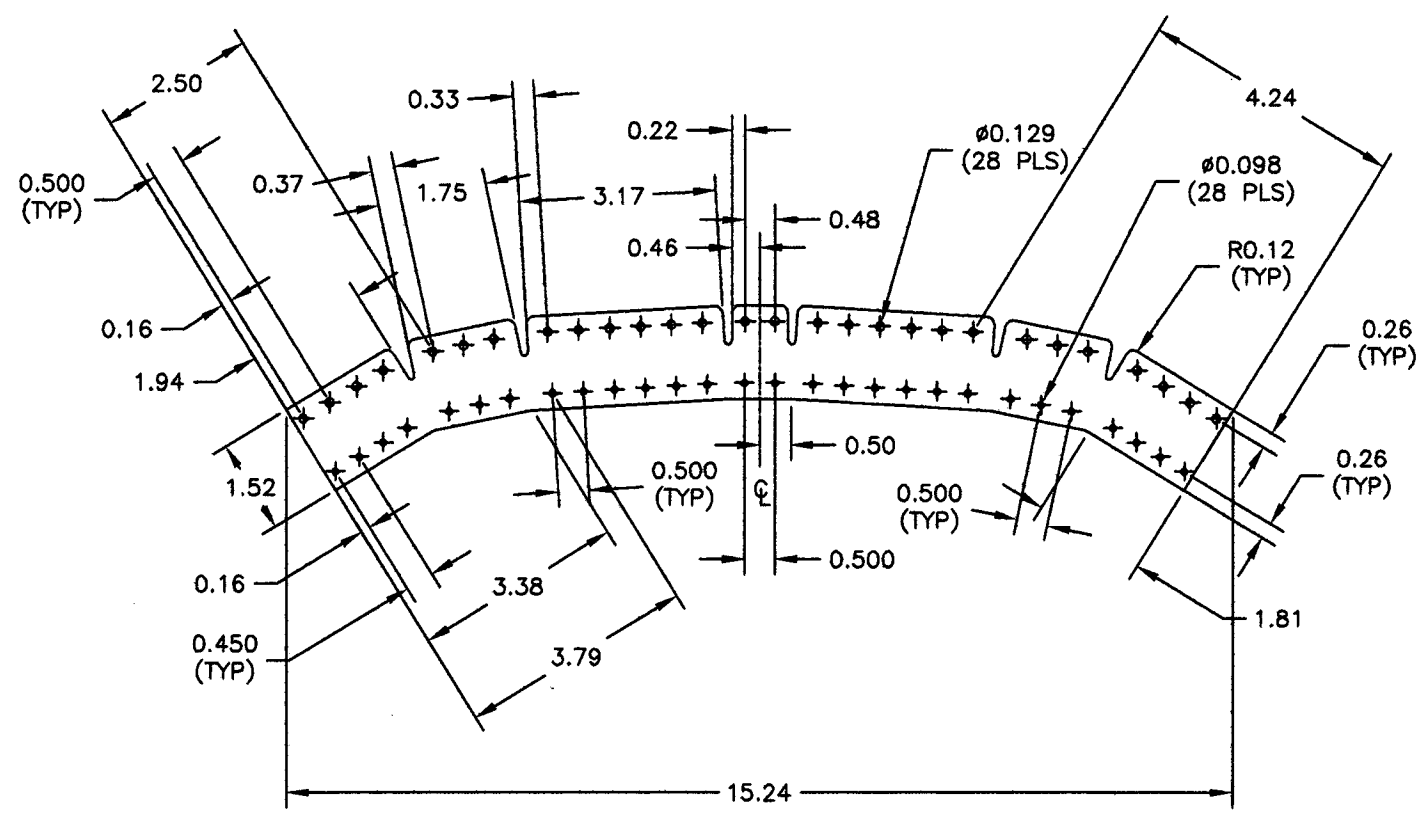
8 7 6 5 4 3 2 1

D

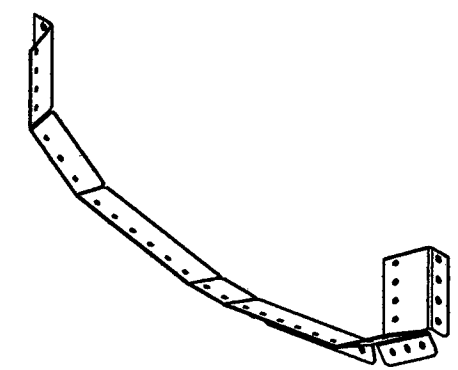
C

B

A



D3651-5F FLAT PATTERN

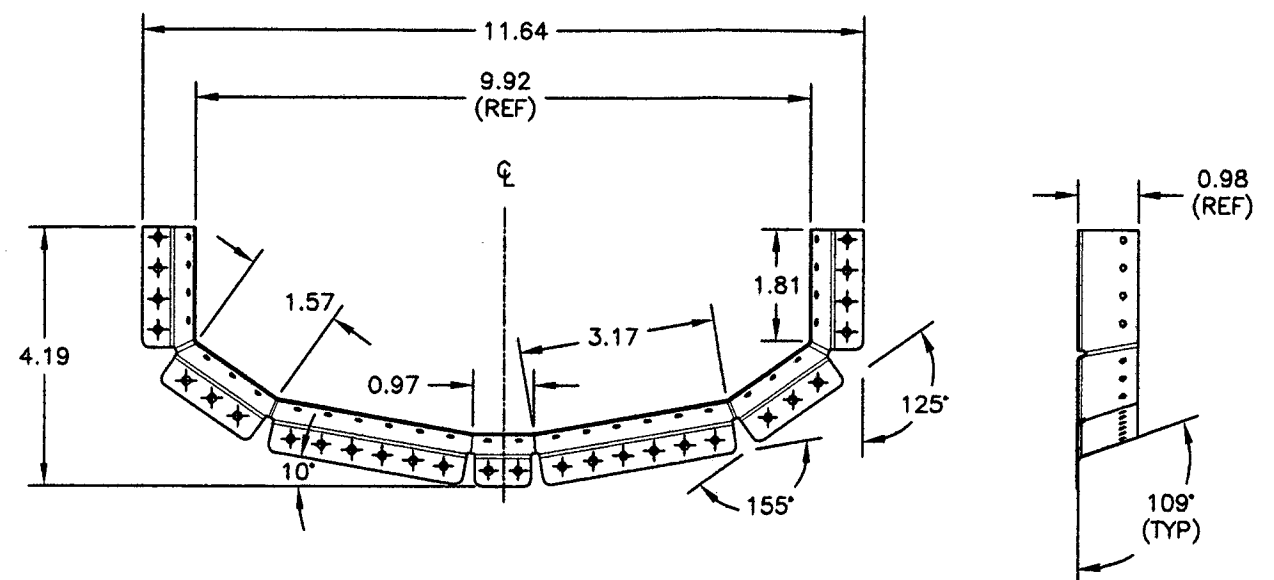


D

C

B

A



D3561-5 TOP FLANGE
(MAKE FROM D3651-5F FLAT PATTERN)

PRELIMINARY ISSUE

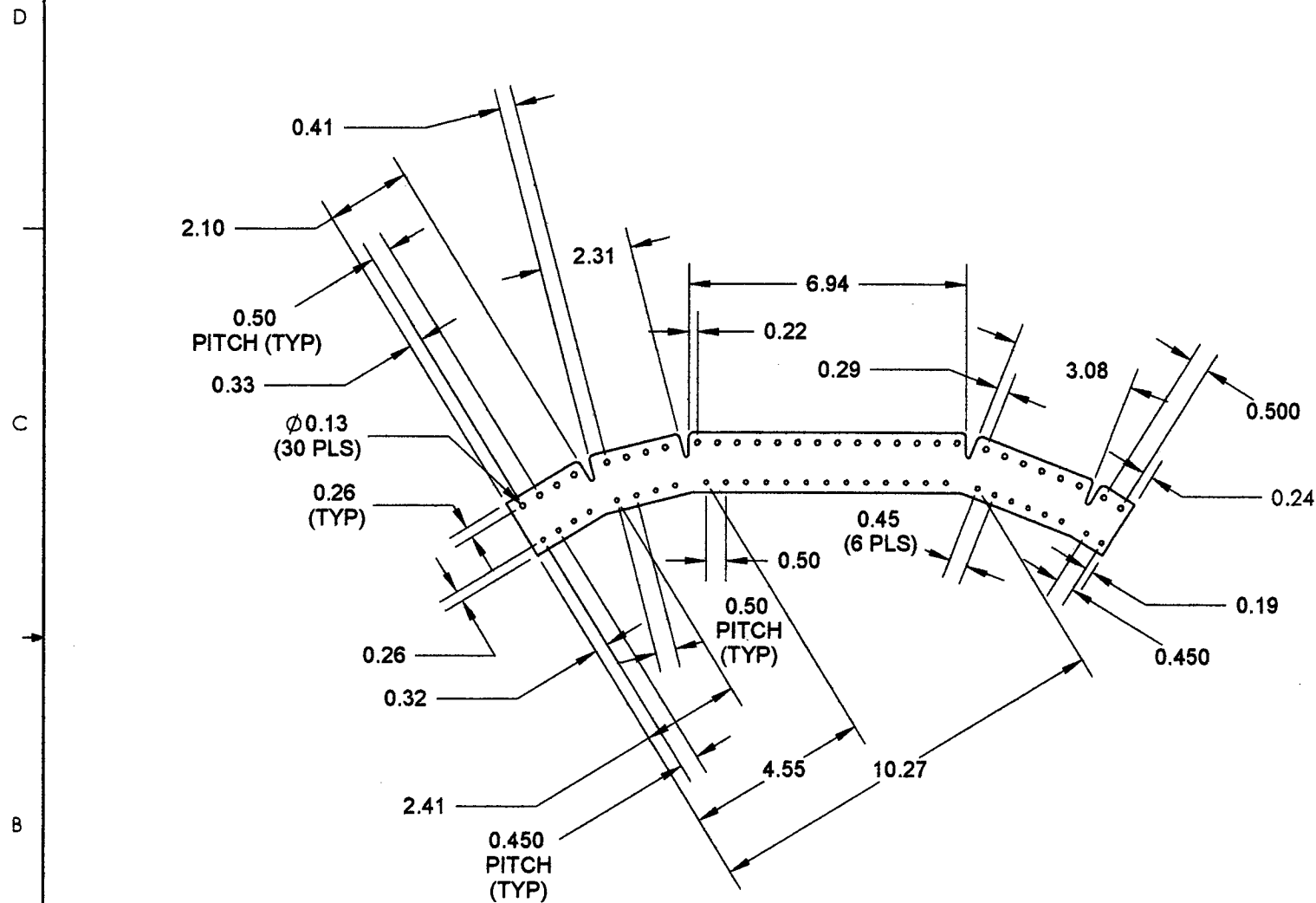
NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-5 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.02 lbs

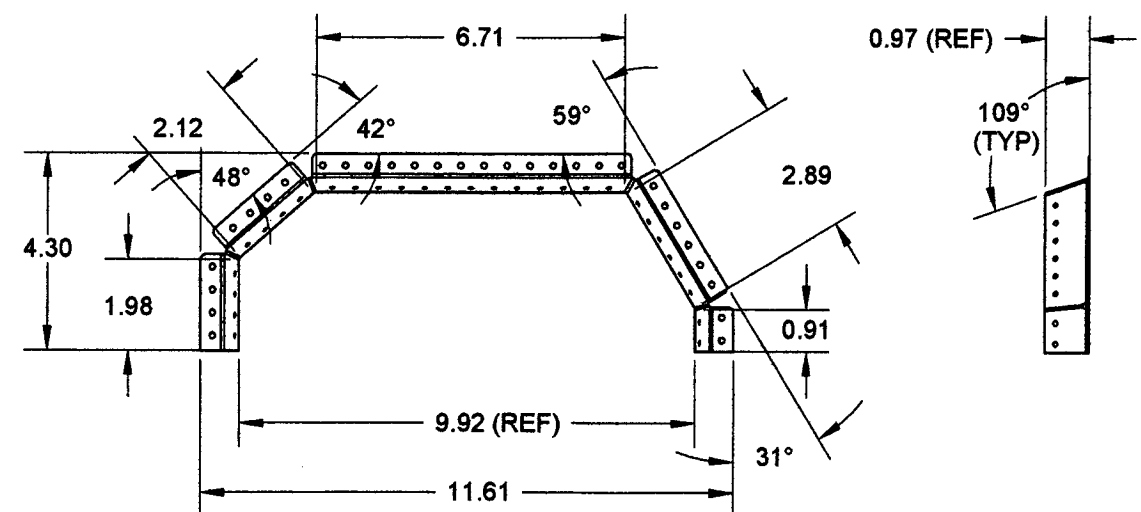
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 5 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:2
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



D3651-7F FLAT PATTERN



D3651-7 BOTTOM FLANGE BEND DETAIL
(MAKE FROM D3651-7 FLAT PATTERN)

PRELIMINARY ISSUE



NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-7 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.02 lbs

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 6 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Date: Monday, 11/19/2007 9:23:39 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : AFT BASE	
Job Number : 35845		
Estimate Number : 13031		
P.O. Number :	Part Number : D36513	
This Issue : 11/19/2007 S.O. No. :	Drawing Number : D3651 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : U/R	
Previous Run : 35020	Material :	
Written By : 	Due Date : 11/26/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 0.4977 sf(s)/Unit Total : 0.4977 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 IB 07-11-19

(PH) Last Page

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PREL

Prog Rev: PREL

IB 07-11-19

(2)

2-Deburr if necessary

IB 07-11-19

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



IB 07-11-19

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

CA 11/20 (2)

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3651

IB 07-11-20 PP

One step

Date: Monday, 11/19/2007 9:23:39 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35845

Part Number: D36513

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Handwritten: 07.11.23 (EC)

7.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

Handwritten: 07.11.23 07.11.22

8.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Handwritten: 07.11.27

Job Completion



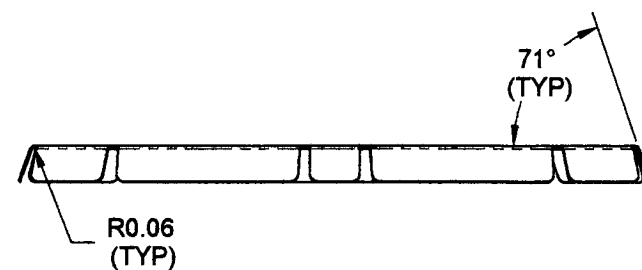
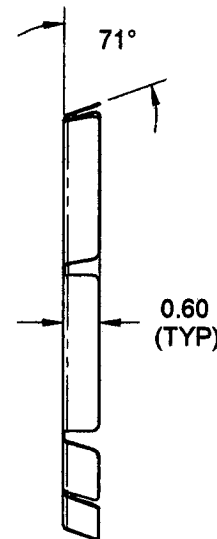
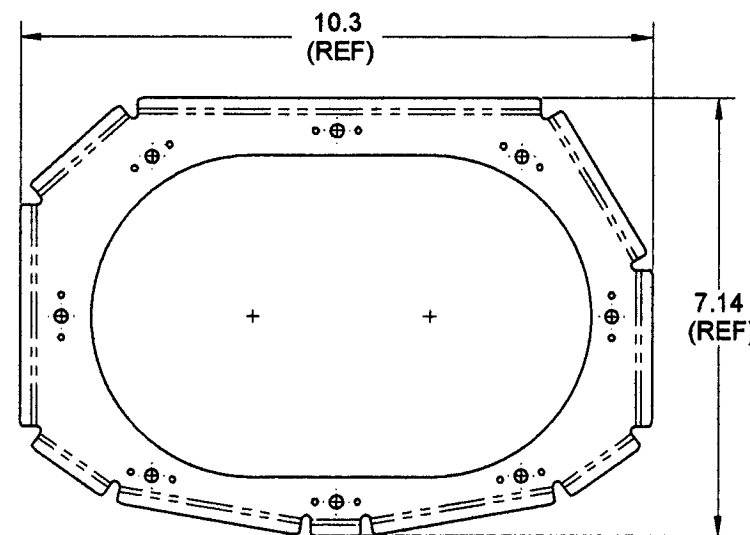
Handwritten: 07.11.27

POSITIVE RECALL

EFFECTIVE 07.11.19 AUTH

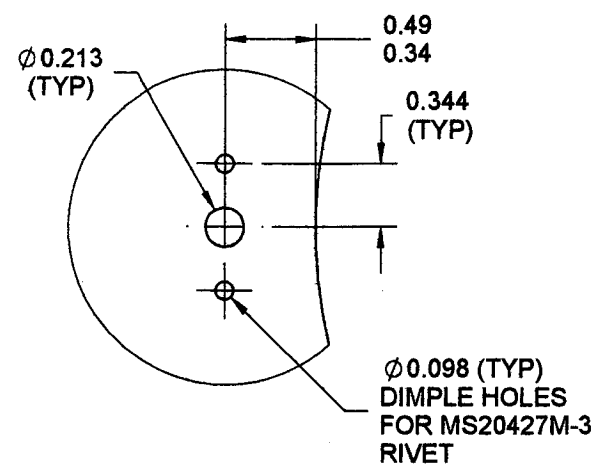
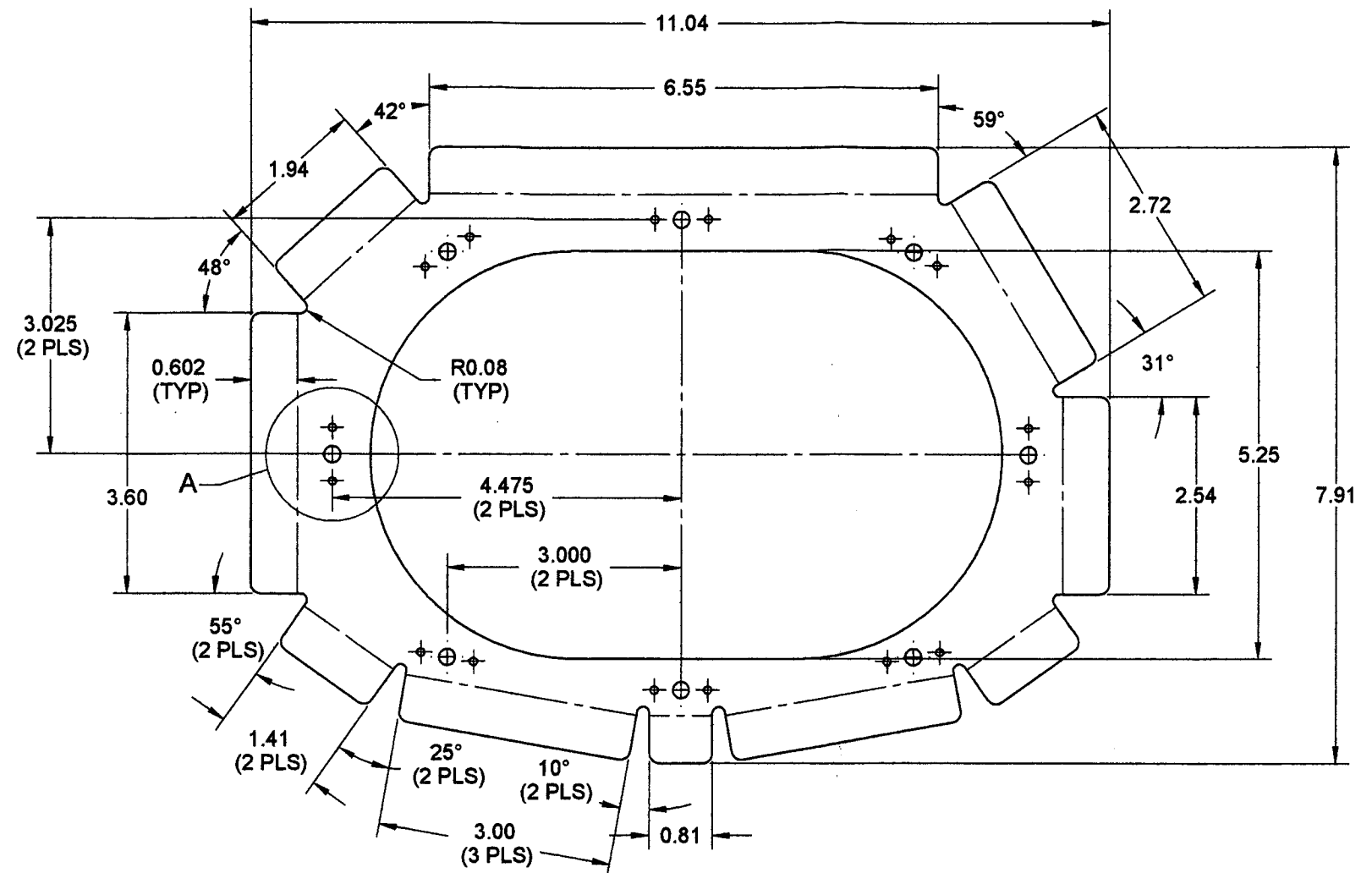
RELEASED DATE

Handwritten: SEE ATTACHED STEPS 7g
7b
7c
07.11.22



D3651-3 BASE
(MAKE FROM D3651-3F FLAT PATTERN)
SCALE 1:3

- NOTES:**
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-3 USING FINE POINT PERMANENT INK MARKER
 - 7) WEIGHT: 0.27 lbs



DETAIL A
SCALE 1:1

D3651-3F FLAT PATTERN

PRELIMINARY ISSUE

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 4 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:2
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

2011-12

07
08
09
10

172

W/o 35845

UE
07-11-22

Step 7g

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

12/07/11/23

UE
07-11-22

Step 7b

QC5 (Upon receipt of STC)

UE
07-11-22

Step 7c

Remove positive recall and release part to Eagle Copters

45

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: AD Date: 07/11/27
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/22	# 1.0	Mat. thickness was wrong mat. was used 0.018" instead of 0.025" thickness	LE 07.11.22	mat. thickness is acceptable this one time only	HB 07-11-22		LE 02.11.22	
				see attached email				

NOTE: Date & initial all entries

Jason Murdoch

From: Susanne Sheldon [ssheldon@dartaero.com]
Sent: Thursday, November 15, 2007 2:37 PM
To: 'L Lacelle'; 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Dale is opening a corrective action to add a gauge thickness chart to QSI003 - Metal fabrication. We will also review the receiving/inspection procedure for marking the sheet metal, the thickness tolerances on sheet metal and the tolerances on the measuring instruments used. All input is welcome.
 Susanne

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: November 15, 2007 2:12 PM
To: 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

COMPLETELY agree!!

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: November 15, 2007 1:41 PM
To: 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Hello all,

Just to confirm ... 0.018" is good for me ... whatever works for production ... minimum requirement is 0.015".

I think Jason's suggestion to add a gauge thickness chart to a QSI is a good idea.
 The confusing thing is that it varies between stainless and carbon steel.
 Maybe not QSI 017 or 018 ... perhaps the Sheet Metal Fabrication QSI.

David

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: Wednesday, November 14, 2007 3:11 PM
To: 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Also what becomes an issue, is that the material is being identified in gauge instead of in inches. This causes workers to pull 25ga material instead of 0.025", for example. Keep in mind, workers are SUPPOSED to verify the thickness of the material before use. The use of gauge is not mentioned in QSI 017 or QSI 018 (QSI 018 does mention " dimensions are in inches " see section 4.1). If the use of gauge will continue, I find it necessary that we should have this included in the QSI, with a chart of gauge converted into inches, along with a tolerance, for each material that we use, since each is different, and approved by engineering.

jmurdoch@dartaero.com

11/22/2007

Q.C. COORDINATOR

From: Eric Charbonneau [mailto:echarbonneau@dartaero.com]

Sent: Wednesday, November 14, 2007 3:16 PM

To: David Shepherd

Cc: Jason Murdoch; Leanne Elsliger; Mike Petsche

Subject: tunnel mat'l

Hi David, just to clarify, for some reason some 0.018" thick 304SS got identified at receiving as 0.025", waterjet operator recorded 0.022" on is FAI (depending on how you measure this is possible), the parts were audited by QC and approved by engineering on a prototype w/o, went thru the whole system unnoticed until today. I think there is more than one department at fault in this. If you want to keep 0.025" on the drawings for the tunnel its fine we have 2 sheets in stock, I was just thinking since we already use a lot of 0.018" thick SS we could go with this and prevent this kind of mistake from happening again by standardising our material inventory.

Thanks,

Eric Charbonneau

Production Engineering Coordinator

DART aerospace Ltd.

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.31/1130 - Release Date: 11/14/2007 9:27 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 11/15/2007 9:34 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.


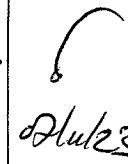
Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

11/22/2007

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval: QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: LD Date: 07/11/23
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/23	17.0	CR3523-4-01 not available.	LE 07.11.23	use CR3523-4-02 and change dwg to this size	 07.11.23	LE 07.11.23	LE 07.11.23	 07/11/23

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: D Date: 07/11/23
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/23	110/60	wrong mat. was used. 0.018" instead of 0.025". was pulled in two different steps	LE 07.11.23	mat. is acceptable this one time only	LE 07-11-23	5 07/11/23	LE 07-11-23	5 07/11/23

NOTE: Date & initial all entries

W/O 35846

✓
07-11-23 Step 20a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CS 07/11/23

✓
07-11-23 Step 20b


QC5 (Upon receipt of STC)

✓
07-11-23 Step 20c

Remove positive recall and release part to Eagle Copters

Date: Monday, 11/19/2007 9:29:37 AM
User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
Job Number : 35848
Estimate Number : 13036
P.O. Number :
This Issue : 11/19/2007 S.O. No. :
Prsht Rev. : NC
First Issue : / / Type : SMALL / MED FAB
Previous Run : 35022
Written By : 
Checked & Approved By :
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC

Drawing Name : AFT BASE
Part Number : D365111
Drawing Number : D3651 UNDER REVIEW
Project Number : N/A
Drawing Revision : U/R
Material :
Due Date : 11/26/2007 Qty: 1 Um: Each

POSITIVE
RECALL

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description:

1.0

G89

coated cloth



Comment: Qty.: 0.7203 sf(s)/Unit Total : 0.7203 sf(s)
G-89 coated cloth

Batch: M105928

IB 07-11-19

2.0

WATER JET

FLOW WATER JET



Comment: FLOW WATER JET
1-Cut as per Dwg D3651

Dwg Rev: PRE 2

Prog Rev: PRE 2

IB 07-11-19

②

2-Deburr if necessary

3.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

IB 07-11-19

4.0

QC8

SECOND CHECK



Comment: SECOND CHECK

5.0

PACKAGING 1

PACKAGING RESOURCE #1



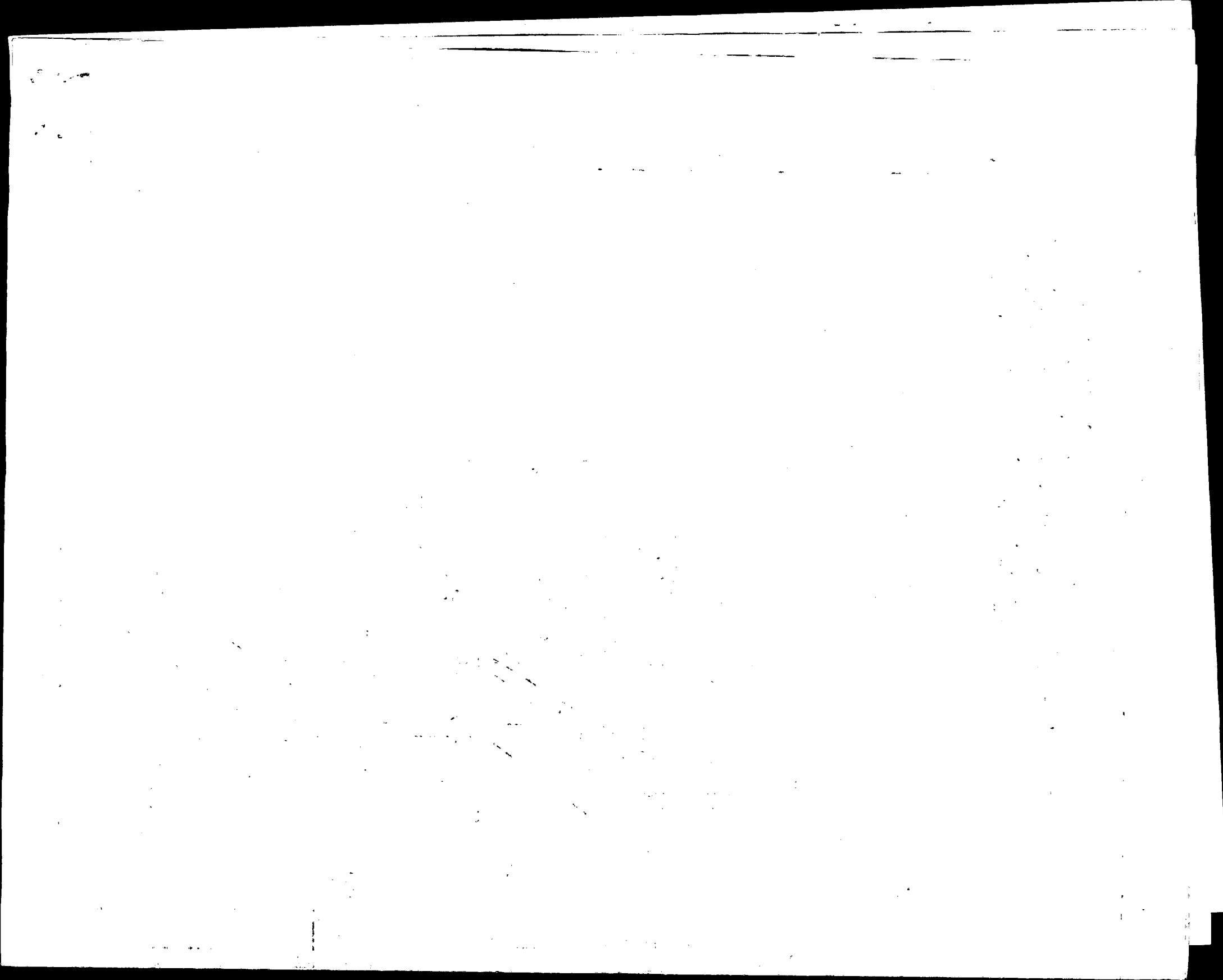
Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

C207111/23

IB 07-11-2002



W/O 35848

16
07.11.22 Step 5a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CL07/01/23

16
07.11.22 Step 5b

QC5 (Upon receipt of STC)

16
07.11.22 Step 5c

Remove positive recall and release part to Eagle Copters

Date: Monday, 11/19/2007 9:30:19 AM
 User: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: AFT BASE
Job Number	: 35849		
Estimate Number	: 13037		
P.O. Number	:	Part Number	: D365113
This Issue	: 11/19/2007 S.O. No. :	Drawing Number	: D3651 UNDER REVIEW
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: / / Type : SMALL /MED FAB	Drawing Revision	: U/R
Previous Run	: 35023	Material	:
Written By	: <u>EC</u>	Due Date	: 11/26/2007 Qty: 1 Um: Each
Checked & Approved By	:		
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC		

POSITIVE
RECALL

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 M304S24GA 304/316 .025 Sheet



Comment: Qty.: 0.7140 sf(s)/Unit Total: 0.7140 sf(s)
 304/316 SS sheet 24 ga (0.025" thick) 018
 Batch: 105592 HB 07-11-19

P12 →
Last Page

2.0 WATER JET FLOW WATER JET



Comment: FLOW WATER JET
 1-Cut as per Dwg D3651
 Dwg Rev: PRE L
 Prog Rev: PRE L

HB 07-11-19

2

2-Deburr if necessary HB 07-11-19

3.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



HB 07-11-19

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0 QC8 SECOND CHECK



Comment: SECOND CHECK

21/1/20

02

5.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock
 Location: _____

CY 07/11/23 02

HB 07-11-20 02

Date: Monday, 11/19/2007 9:30:19 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35849

Part Number: D365113

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

207/11/27

Job Completion



W 07.11.27

POSITIVE RECALL

EFFECTIVE 07.11.19

RELEASED _____

AUTH

DATE

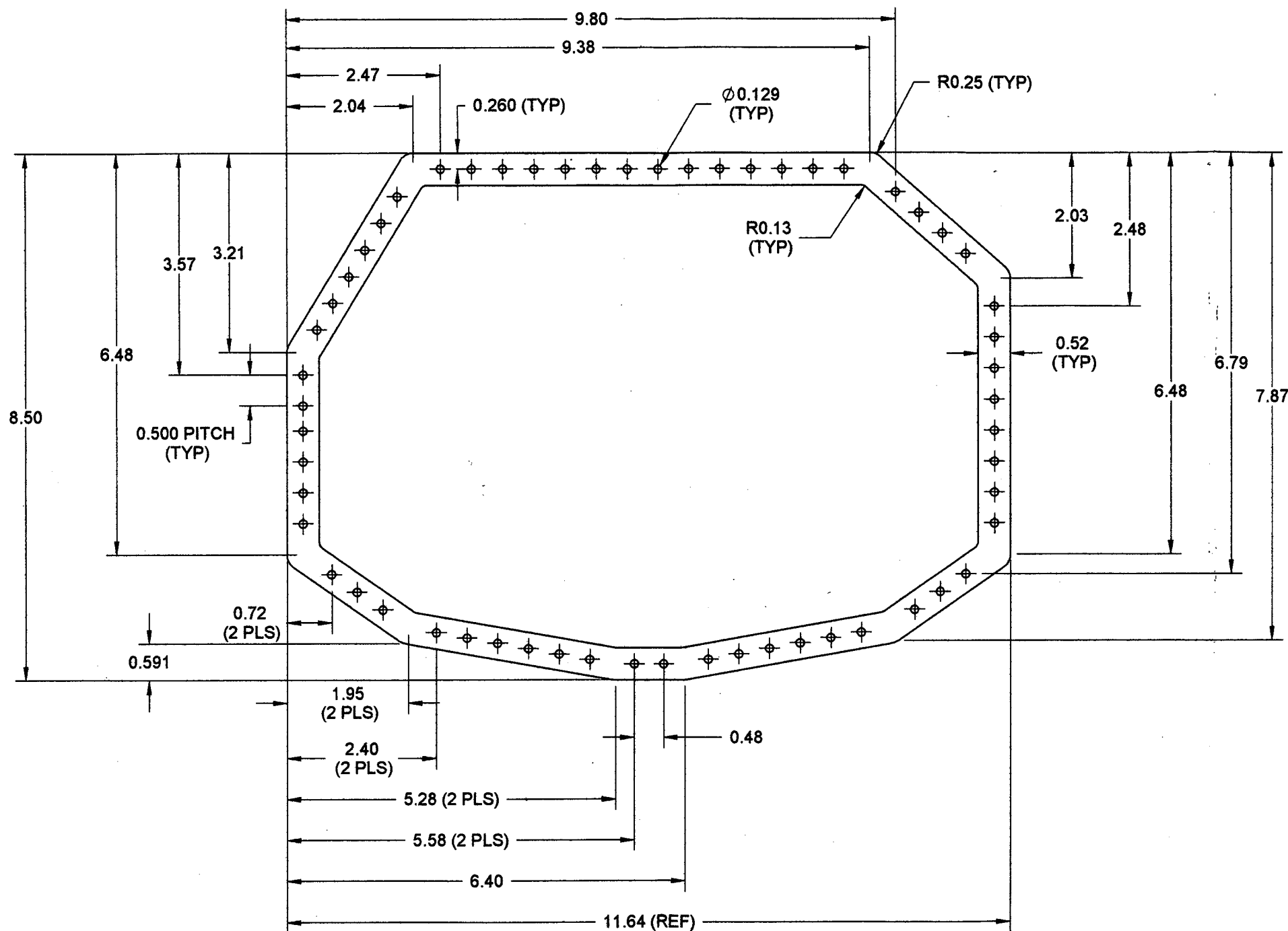
SEE ATTACHED STEPS

S4

S6

S6

LE 07.11.22



PRELIMINARY ISSUE

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-13 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.10 lbs

D3651-13 OUTSIDE DOUBLER

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 9 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:4
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/o 35849

VE Step 5a

07-11-22 Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CL 07/11/23

VE Step 5b

07-11-22 QC5 (Upon receipt of STC)

VE Step 5c

07-11-22 Remove positive recall and release part to Eagle Copters

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: LD Date: 07/11/27
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/22	1.0	wrong mat. was used. 0.018" instead of 0.025" thickness	LE 07.11.22	mat. thickness is acceptable. This one Time only	LE 07.11.22	07/11/22	LE 07.11.22	07/11/22
				see Attached email				

NOTE: Date & initial all entries

Jason Murdoch

From: Susanne Sheldon [ssheldon@dartaero.com]
Sent: Thursday, November 15, 2007 2:37 PM
To: 'L Lacelle'; 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Dale is opening a corrective action to add a gauge thickness chart to QSI003 - Metal fabrication. We will also review the receiving/inspection procedure for marking the sheet metal, the thickness tolerances on sheet metal and the tolerances on the measuring instruments used. All input is welcome.
 Susanne

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: November 15, 2007 2:12 PM
To: 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

COMPLETELY agree!!

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: November 15, 2007 1:41 PM
To: 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Hello all,

Just to confirm ... 0.018" is good for me ... whatever works for production ... minimum requirement is 0.015".

I think Jason's suggestion to add a gauge thickness chart to a QSI is a good idea.
 The confusing thing is that it varies between stainless and carbon steel.
 Maybe not QSI 017 or 018 ... perhaps the Sheet Metal Fabrication QSI.

David

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: Wednesday, November 14, 2007 3:11 PM
To: 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Also what becomes an issue, is that the material is being identified in gauge instead of in inches. This causes workers to pull 25ga material instead of 0.025", for example. Keep in mind, workers are SUPPOSED to verify the thickness of the material before use. The use of gauge is not mentioned in QSI 017 or QSI 018 (QSI 018 does mention " dimensions are in inches " see section 4.1). If the use of gauge will continue, I find it necessary that we should have this included in the QSI, with a chart of gauge converted into inches, along with a tolerance, for each material that we use, since each is different, and approved by engineering.

jmurdoch@dartaero.com

11/22/2007

Q.C. COORDINATOR

From: Eric Charbonneau [mailto:echarbonneau@dartaero.com]

Sent: Wednesday, November 14, 2007 3:16 PM

To: David Shepherd

Cc: Jason Murdoch; Leanne Elsliger; Mike Petsche

Subject: tunnel mat'l

Hi David, just to clarify, for some reason some 0.018" thick 304SS got identified at receiving as 0.025", waterjet operator recorded 0.022" on is FAI (depending on how you measure this is possible), the parts were audited by QC and approved by engineering on a prototype w/o, went thru the whole system unnoticed until today. I think there is more than one department at fault in this. If you want to keep 0.025" on the drawings for the tunnel its fine we have 2 sheets in stock, I was just thinking since we already use a lot of 0.018" thick SS we could go with this and prevent this kind of mistake from happening again by standardising our material inventory.

Thanks,

Eric Charbonneau

Production Engineering Coordinator

DART aerospace Ltd.

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.31/1130 - Release Date: 11/14/2007 9:27 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 11/15/2007 9:34 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

No virus found in this outgoing message.



Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

11/22/2007

Date: Monday, 11/19/2007 9:29:04 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : AFT BASE	
Job Number : 35847		
Estimate Number : 13033		
P.O. Number :	Part Number : D36519	
This Issue : 11/19/2007 S.O. No. :	Drawing Number : D3651 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : U/R	
Previous Run : 35021	Material :	
Written By : 	Due Date : 11/26/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

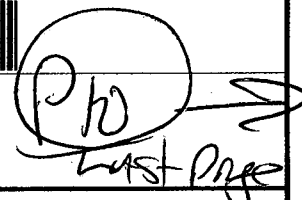
1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 0.4526 sf(s)/Unit Total : 0.4526 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 IB 07-11-19



2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PRE 2 IB 07-11-19

Prog Rev: PRE 2

②

2-Deburr if necessary IB 07-11-19

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



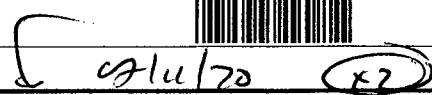
Comment: INSPECT PARTS AS THEY COME OFF MACHINE

IB 07-11-19

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK



5.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------

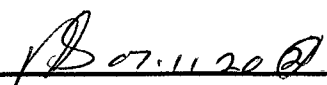


Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

07/11/23



Date: Monday, 11/19/2007 9:29:04 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35847

Part Number: D36519

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

207/11/27

Job Completion



u 07/11/27

POSITIVE RECALL

EFFECTIVE 07.11.19 AUTH u

RELEASED _____ DATE _____

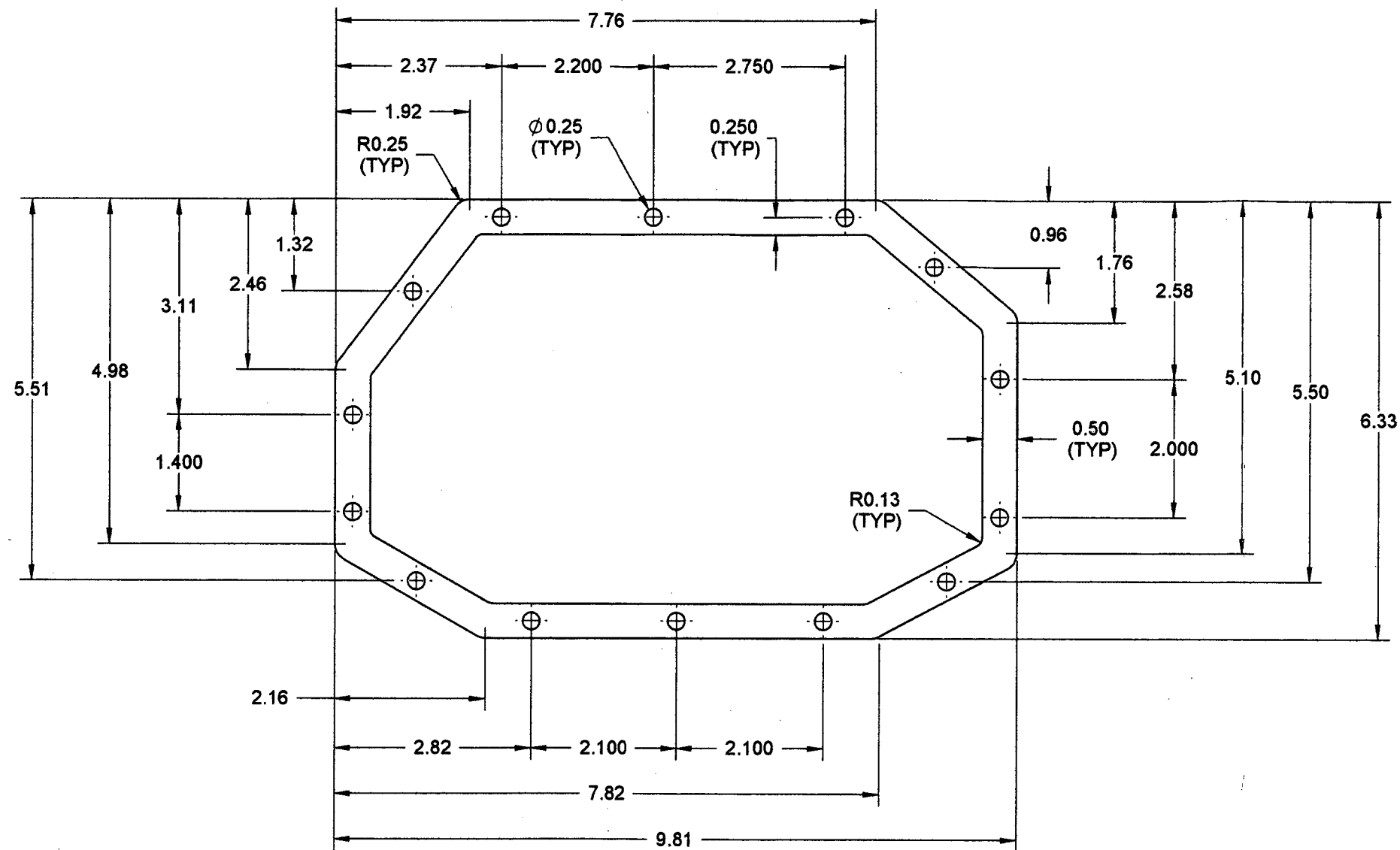
SEE ATTACHED STOPS

Sa

Sb

Sc

u 07.11.22



D3651-9 INSIDE DOUBLER

PRELIMINARY ISSUE

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-9 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.07 lbs

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 7 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:4
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART AEROSPACE LTD		Work Order:	35847
Description: AFT BASE		Part Number:	D3651-9
Inspection Dwg: D3651-9 Rev: PRE. L		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø .25	+ .005 - .001	.253	x			
9.81	+/- .030	9.81	✓			
6.33	+/- .030	6.33	✓			
2.100	+/- .010	2.100	x			
2.82	+/- .030	2.82	x			
5.50	+/- .030	5.50	x			
5.10	+/- .030	5.10	x			
2.00	+/- .030	2.00	x			
2.58	+/- .030	2.58	x			
1.76	+/- .030	1.76	x			
.96	+/- .030	.96	x			
.250	+/- .010	.250	✓			
2.750	+/- .010	2.750	✓			
2.200	+/- .010	2.200	x			
1.32	+/- .030	1.32	✓			
3.11	+/- .030	3.11	✓			
1.40	+/- .030	1.40	x			
5.51	+/- .030	5.51	x			

Measured by: <u>CB</u>	Audited by: <u>SA</u>	Prototype Approval: <u>[Signature]</u>
Date: <u>07-11-19</u>	Date: <u>07/11/20</u>	Date: <u>07/11/20</u>

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	

W/0 35847

Step 5a ^{✓ 07.11.22}

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

07/11/23

Step 5b ^{✓ 07.11.22}

QC5 (Upon receipt of STC)

Step 5c ^{✓ 07.11.22}

Remove positive recall and release part to Eagle Copters

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: LD Date: 07/11/22
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/22	#10	wrong math. was used. 0.018" instead of 0.025" thickness.	LE 07.11.22	math. is acceptable this one time only. see Attached email	LE 07/11/22 LB 07-11-22	07/11/22	LE 07.11.22	07/11/22

NOTE: Date & initial all entries

Jason Murdoch

From: Susanne Sheldon [ssheldon@dartaero.com]
Sent: Thursday, November 15, 2007 2:37 PM
To: 'L Lacelle'; 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Dale is opening a corrective action to add a gauge thickness chart to QSI003 - Metal fabrication. We will also review the receiving/inspection procedure for marking the sheet metal, the thickness tolerances on sheet metal and the tolerances on the measuring instruments used. All input is welcome.
 Susanne

From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: November 15, 2007 2:12 PM
To: 'David Shepherd'; 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

COMPLETELY agree!!

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: November 15, 2007 1:41 PM
To: 'Jason Murdoch'; 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

Hello all,

Just to confirm ... 0.018" is good for me ... whatever works for production ... minimum requirement is 0.015".

I think Jason's suggestion to add a gauge thickness chart to a QSI is a good idea.
 The confusing thing is that it varies between stainless and carbon steel.
 Maybe not QSI 017 or 018 ... perhaps the Sheet Metal Fabrication QSI.

David

From: Jason Murdoch [mailto:jmurdoch@dartaero.com]
Sent: Wednesday, November 14, 2007 3:11 PM
To: 'Eric Charbonneau'; 'David Shepherd'
Cc: 'Leanne Elsliger'; 'Mike Petsche'; 'L Lacelle'; 'Suzane Sheldon'; 'Dale Trepanier'
Subject: RE: tunnel mat'l

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jmurdoch@dartaero.com

11/22/2007

Q.C. COORDINATOR

From: Eric Charbonneau [mailto:echarbonneau@dartaero.com]

Sent: Wednesday, November 14, 2007 3:16 PM

To: David Shepherd

Cc: Jason Murdoch; Leanne Elsliger; Mike Petsche

Subject: tunnel mat'l

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Thanks,

Eric Charbonneau

Production Engineering Coordinator

DART *aerospace Ltd.*

T(613) 632-5200

F(613) 632-4443

echarbonneau@dartaero.com

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.31/1130 - Release Date: 11/14/2007 9:27 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 11/15/2007 9:34 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

No virus found in this outgoing message.



Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.15.33/1132 - Release Date: 15/11/2007 9:34 AM

11/22/2007

Date: Monday, 11/19/2007 9:19:36 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : GASKET	
Job Number : 35844		
Estimate Number : 13071		
P.O. Number :	Part Number : D36511	
This Issue : 11/19/2007 S.O. No. :	Drawing Number : D3651 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : U/R	
Previous Run :	Material :	
Written By : 	Due Date : 11/26/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	G89	coated cloth
-----	-----	--------------



Comment: Qty.: 0.4885 sf(s)/Unit Total : 0.4885 sf(s)

G-89 coated cloth

Batch: M105928 IB 07-11-19

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PRFL
 Prog Rev: PRFL

IB 07-11-19



2-Deburr if necessary

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



IB 07-11-19

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

IB 07-11-20

5.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

IB 07-11-23

IB 07-11-20

Date: Monday, 11/19/2007 9:19:36 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: GASKET

Job Number: 35844

Part Number: D36511

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07/11/27

Job Completion



u 07.11.27

POSITIVE RECALL

EFFECTIVE 07.11.19 AUTH u

RELEASED _____ DATE _____

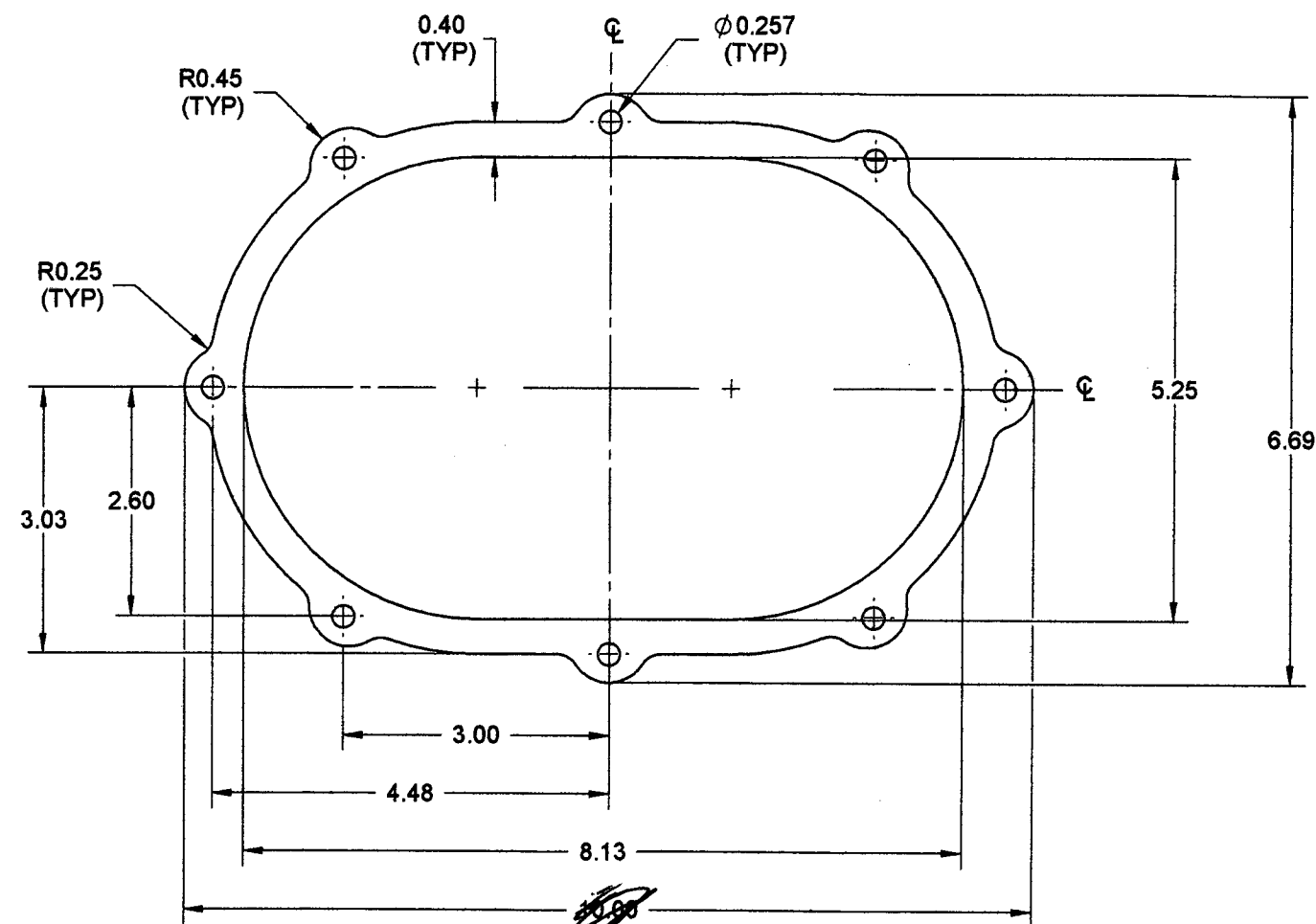
SEE ATTACHED

STEPS 54

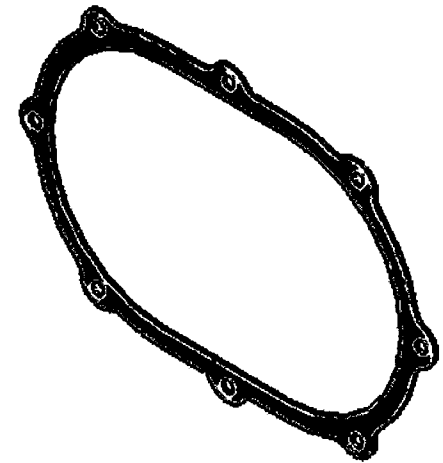
56

5C

u 07.11.22



D3651-1 GASKET



PRELIMINARY ISSUE


NOTES:

- 1) MATERIAL: THERMO-CHEM P/N G-89, (REF. 0.060 THICK)
POSSIBLE SUPPLIER: A.R. THOMSON GROUP
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3651-1 USING FINE POINT PERMANENT INK MARKER
- 7) PART IS SYMMETRIC ABOUT CL
- 8) WEIGHT: 0.09 lbs

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3651	SHEET 3 OF 9
APPROVED		TITLE	SCALE
DE APPR.		AFT BASE ASSEMBLY	1:2
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

Date: Tuesday, 11/20/2007 8:43:50 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : DOUBLER	
Job Number : 35899		
Estimate Number : 13055		
P.O. Number :	Part Number : D36541	
This Issue : 11/20/2007 S.O. No. :	Drawing Number : D3654 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / / Type : SMALL /MED FAB	Drawing Revision : U/R	
Previous Run : 35412	Material :	
Written By : 	Due Date : 11/27/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-10-29 DD verified by: EC		



Additional Product

Job Number: 

Seq. #: Machine Or Operation: Description :

1.0 M304S16GA



Comment: Qty.: 0.36750 sf(s)/Unit Total : 0.36750 sf(s)
 304/316 SS sheet 16 ga (0.063" thick)
 Batch: M165061

EC 07-11-23

2.0 WATER JET

FLOW WATER JET



Comment: FLOW WATER JET
 1-Cut as per Dwg D3654
 Dwg Rev: U/R
 Prog Rev: U/R

EC 07-11-23

2-Deburr if necessary

3.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

EC 07-11-23

4.0 QC8

SECOND CHECK



Comment: SECOND CHECK

EC 07-11-23

5.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1
 Identify and stock
 Location: _____

EC 07-11-23

Date: Tuesday, 11/20/2007 8:43:50 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: DOUBLER

Job Number: 35899

Part Number: D36541

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

DOT 11/27

Job Completion



DOT 11/27

ADD 5a
5b
5c

(SEE ATTACHED)

CE
02.11.23

POSITIVE RECALL

EFFECTIVE 07.11.23 AUTH

RELEASED _____ DATE _____

W/o 35844

W
07.11.22 Step 5a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

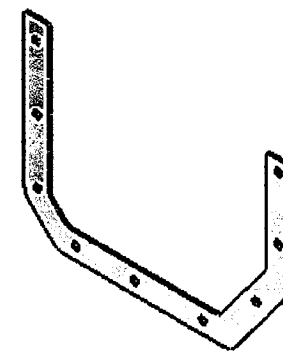
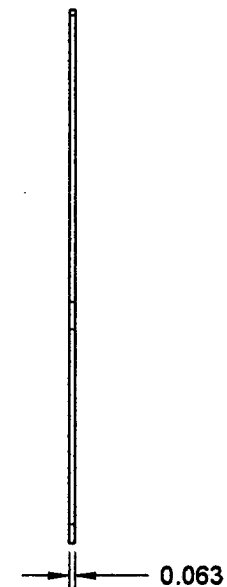
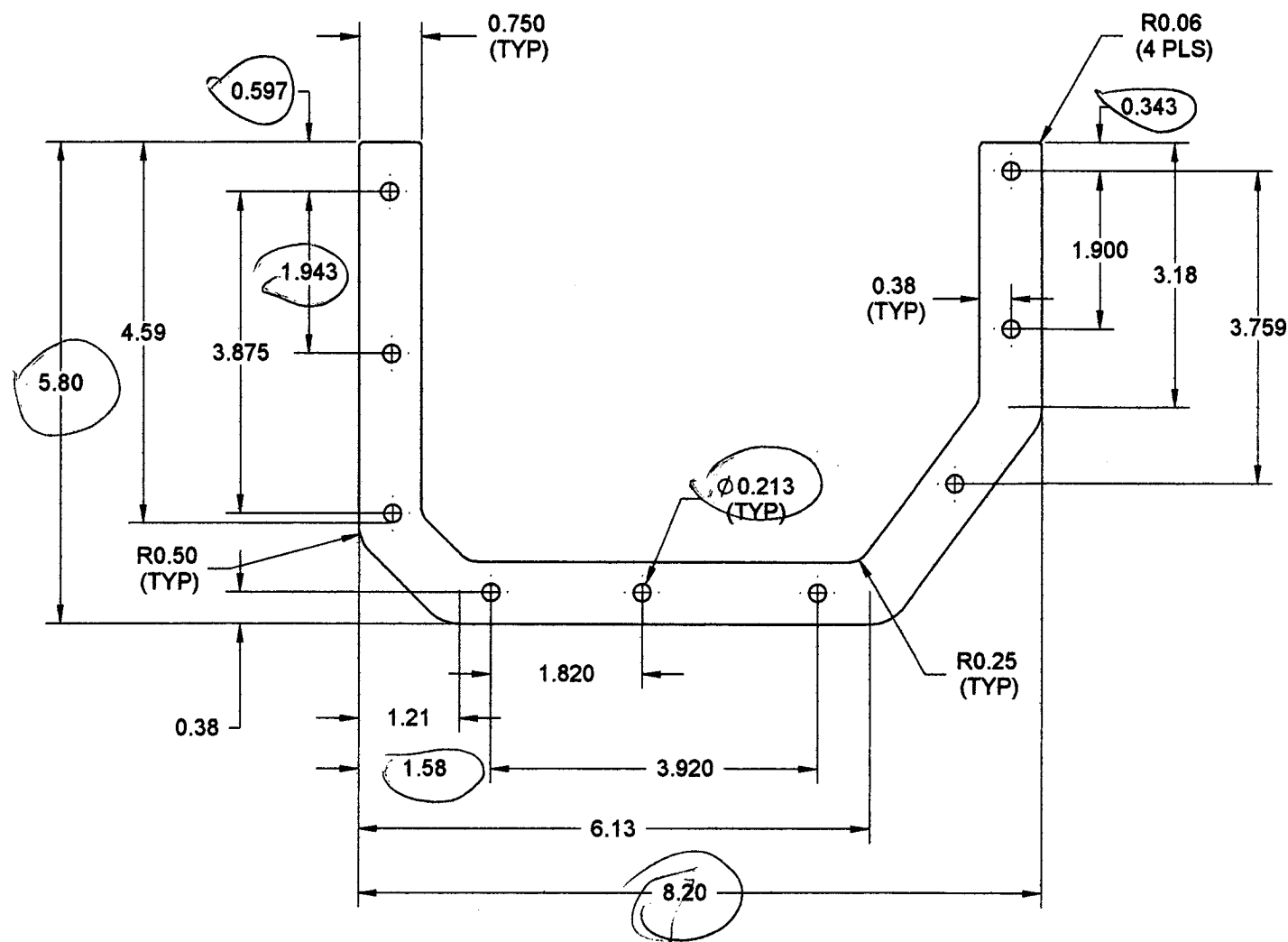
CL0711123

W
07.11.22 Step 5b

QC5 (Upon receipt of STC)

W
07.11.22 Step 5c

Remove positive recall and release part to Eagle Copters



D3654-1 DOUBLER

PRELIMINARY ISSUE

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.063 (16 GAUGE) SHEET PER MIL-S-5019 (REF. DART SPEC. M304S16GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3654-1 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.03 lbs

A	NEW ISSUE	RF	07.11.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3654	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		DOUBLER	1:2
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O 35899

Step 59

LE

07.11.23

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

07/11/23

LE

Step 56

07.11.23

QC5 (Upon receipt of STC)

LE

Step 56

07.11.23

Remove positive recall and release part to Eagle Copters

DART AEROSPACE LTD		Work Order: 35899
Description: Crosstube Assembly Doubler		Part Number: 123651-1
Inspection Dwg: 12374 123654	Rev: A Prelim	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	8.20	± 0.030	8.21	✓		VLM	
	5.80	± 0.030	5.80	✓			
	1.943	± 0.010	1.943	✓			
	0.597	± 0.010	0.597	✓			
	Ø 0.213	$+0.006 - 0.001$	0.213	✓			
	0.343	± 0.010	0.343	✓			
	1.58	± 0.030	1.58	✓			
SIDE B							

Measured by: KE	Audited by: E	Prototype Approval:	N/A
Date: 07.11.23	Date: 07.11.23	Date:	N/A

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



DART AEROSPACE LTD
1270 Aberdeen Street
Hawkesbury, ON, K6A 1K7
CANADA

Tel: 613 632 5200

Fax: 613 632 1185

Email: heli@dartaero.com

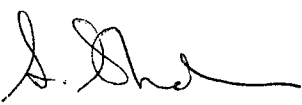
Web Site: www.dartaero.com

CERTIFICATE OF CONFORMANCE

Part no:	Description:	Drawing:	Quantity:	Batch:
D3648-041	Drive Shaft Tunnel	D3648 Rev. A	One	35973
D3654-1	Doubler	D3654 Rev. A	One	35899
D3682-1	Gasket	D3682 Rev. A	One	35974

ALL MATERIALS AND PARTS HAVE BEEN INSPECTED AND COMPLY WITH THE
DRAWINGS LISTED ABOVE.



DATE: 7/Jan/2008


BY: Susanne Sheldon, eng
APPROVED QA SIGNATORY


Leanne Elsliger, P. Eng
DESIGN ENGINEER

Date: Wednesday, 11/14/2007 8:25:21 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : TOP PANEL ASS'Y	
Job Number : 35714		
Estimate Number : 13034		
P.O. Number :	Part Number : D36509	
This Issue : 11/14/2007 S.O. No. :	Drawing Number : D3650 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / /	Drawing Revision : U/R	
Previous Run : 35015	Material :	
Written By : 	Due Date : 11/21/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	M304S24GA	304/316 .025 Sheet
-----	-----------	--------------------



Comment: Qty.: 0.0536 sf(s)/Unit Total : 0.0536 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 IB 07-11-19

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3650

Dwg Rev: PREL

IB 07-11-19

(2)

Prog Rev: PREL

2-Deburr if necessary

IB 07-11-19

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--



IB 07-11-19

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

E 07/11/20 (72)

5.0	BRAKE NC	NC BRAKE
-----	----------	----------



Comment: NC BRAKE

Form as per Dwg D3650

IB 07.11.20 (1)

Date: Wednesday, 11/14/2007 8:25:22 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: TOP PANEL ASSY

Job Number: 35714

Part Number: D36509

Job Number:



Seq. #: Machine Or Operation: Description :

6.0

QC5

INSPECT WORK TO CURRENT STEP



UE
07.11.23



Comment: INSPECT WORK TO CURRENT STEP

7.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

CD 07/11/23 0

8.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

D 07/11/27

Job Completion



11/14/27

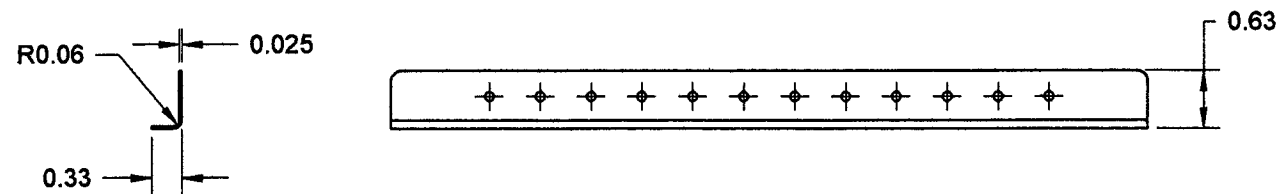
POSITIVE RECALL

EFFECTIVE 07/11/19 AUTH 11

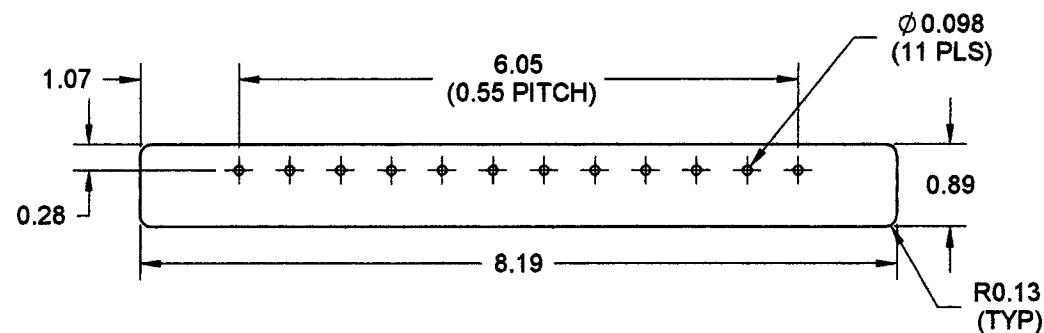
RELEASED _____ DATE _____

ADD 7a
7b
7c

SEE ATTACHED
UE 07.11.23



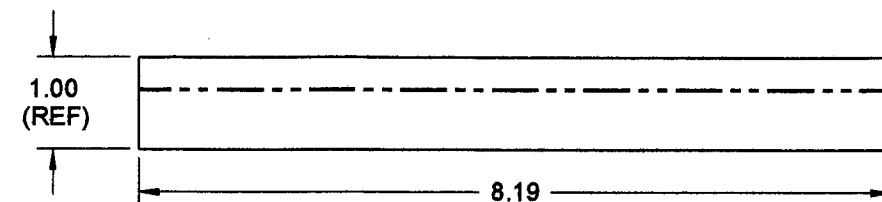
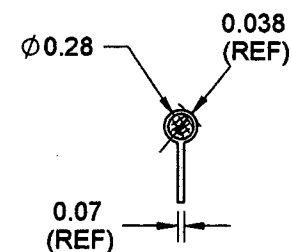
D3650-9 ANGLE
(MAKE FROM D3650-9F FLAT PATTERN)
(SCALE 1:2)



D3650-9F FLAT PATTERN
(SCALE 1:2)

D3650-9 NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 THICK (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-9 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.05 lbs



D3650-7 SEAL
(SCALE 1:2)

D3650-7 NOTES:

- 1) MATERIAL: P/N 41521X120HK-FT TADPOLE SEAL (REF. BELL P/N 120-104-1)
POSSIBLE SUPPLIER: KIRKHILL-TA
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-7 USING FINE POINT PERMANENT INK MARKER

PRELIMINARY ISSUE

DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3650	SHEET 8 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:8
DATE	07.11.07	<small>COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/11/23	#1	wrong mat. thickness was used. 0.018" instead of 0.025"	LE 07.11.23	MAT. is Accat thickness is Accatable this one time only	LE 07.11.23	✓ 07/11/23	LE 07/11-23	✓ 07/11/23

NOTE: Date & initial all entries

W/O 35714

VE
07-11-23 Step 7a

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

CS 07/11/23

VE
07-11-23 Step 7b



QC5 (Upon receipt of STC)

VE
07-11-23 Step 7c

Remove positive recall and release part to Eagle Copters

Date: Wednesday, 11/14/2007 8:32:26 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : TOP PANNEL ASS'Y	
Job Number : 35715		
Estimate Number : 13067		
P.O. Number :	Part Number : D3650041	
This Issue : 11/14/2007 S.O. No. :	Drawing Number : D3650 UNDER REVIEW	
Prsht Rev. : NC	Project Number : N/A	
First Issue : / /	Drawing Revision : U/R	
Previous Run :	Material :	
Written By : 	Due Date : 11/21/2007	Qty: 1 Um: Each
Checked & Approved By :		
Comment : Est Rev:A New Issue 07-11-12 EC verified by: DD		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	MS20427M33	Rivet
-----	------------	-------



4105 728



Comment: Qty.: 88.0000 Each(s)/Unit Total : 88.0000 Each(s)
 Rivet

1/11/07 11-230

2.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1
 pick kit

①

3.0	D36501	AFT PANEL
-----	--------	-----------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 AFT PANEL

B35707

①

4.0	D36503	CENTER PANEL
-----	--------	--------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 CENTER PANEL

11035705

①

5.0	D36505	CENTER PANEL
-----	--------	--------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 CENTER PANEL

B35709

①

Date: Wednesday, 11/14/2007 8:32:26 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: TOP PANNEL ASS'Y

Job Number: 35715

Part Number: D3650041

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

6.0	AN3C3A	Bolt
-----	--------	------



Comment: Qty.: 12.0000 Each(s)/Unit Total : 12.0000 Each(s)
Bolt

M106 277

7.0	AN960C10	WASHER
-----	----------	--------



Comment: Qty.: 12.0000 EACH(s)/Unit Total : 12.0000 EACH(s)
WASHER

M106 302

8.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1
-----	-------------	-------------------------------



Comment: SMALL & MEDIUM FAB RESOURCE 1

1- Form dimple for MS20427M3 rivet per dwg D3649
*****ensure dimples are on the proper side*****

2- Assemble nut plates as per dwg D3649

07.11.22 ①

9.0	QC5	INSPECT WORK TO CURRENT STEP
-----	-----	------------------------------



Comment: INSPECT WORK TO CURRENT STEP

07.11.23

10.0	PACKAGING 1	PACKAGING RESOURCE #1
------	-------------	-----------------------



Comment: PACKAGING RESOURCE #1
Identify and stock
Location: _____

07/11/23 ①

11.0	QC21	FINAL INSPECTION/W/O RELEASE
------	------	------------------------------



Comment: FINAL INSPECTION/W/O RELEASE

07/11/27
6637.627

Job Completion

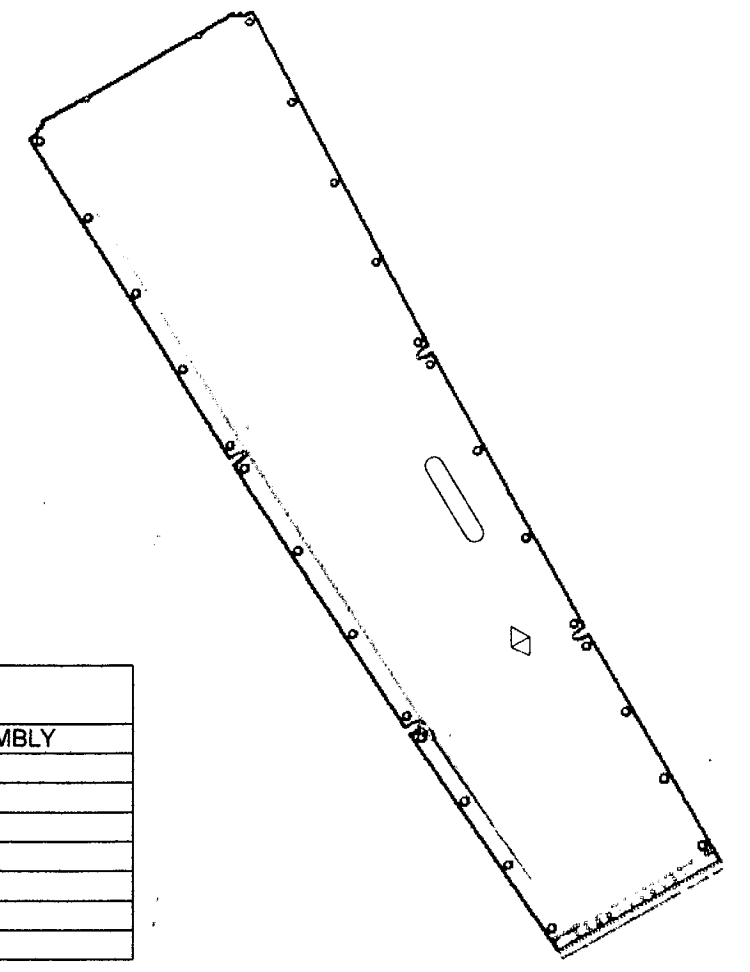
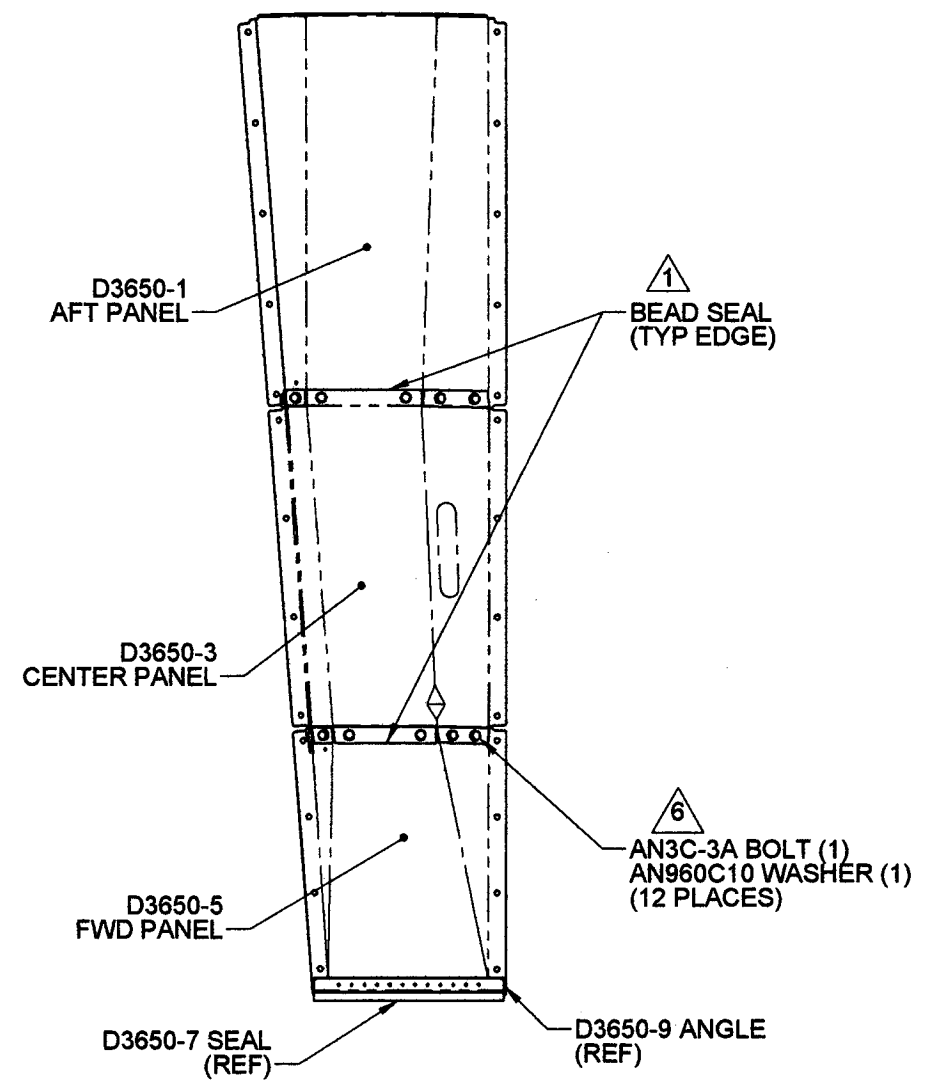
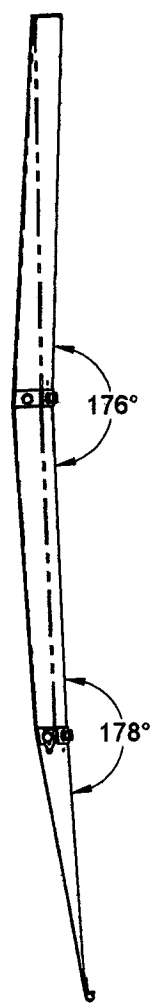


POSITIVE RECALL
EFFECTIVE 07/11/19 AUTH U
RELEASED _____ DATE _____

8 7 6 5 4 3 2 1

D
C
B
A

D
C
B
A



PART LIST

QTY -041	PART NUMBER	DESCRIPTION
X	D3650-041	TOP PANEL ASSEMBLY
1	D3650-1	AFT PANEL
1	D3650-3	CENTER PANEL
1	D3650-5	FWD PANEL
12	AN3C-3A	BOLT
12	AN960C10	WASHER

D3650-041 TOP PANEL ASSEMBLY

PRELIMINARY ISSUE

NOTES:



- 1) SEAL GAPS USING 3M HIGH PERFORMANCE CONTACT ADHESIVE 1357
- 2) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 3) UNITS: INCHES UNLESS OTHERWISE NOTED
- 4) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 5) IDENTIFICATION: IDENTIFY WITH DART P/N D3650-041 USING FINE POINT PERMANENT INK MARKER
- 6) TORQUE FASTENERS UP TO 25 in-lb
- 7) WEIGHT: 3.3 lbs

6	NEW ISSUE	RF	07.11.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. 1
MFG. APPR.		D3650	SHEET 1 OF 8
APPROVED		TITLE	SCALE
DE APPR.		TOP PANEL ASSEMBLY	1:8
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD <small>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

Date: Friday, 11/23/2007 11:53:44 AM
 User: Eric Charbonneau

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: GASKET	
Job Number	: 35974	Part Number	: D36821	
Estimate Number	: 13035	Drawing Number	: D3682 UNDER REVIEW	
P.O. Number	:	Project Number	: N/A	
This Issue	: 11/23/2007 S.O. No. :	Drawing Revision	: U/R	
Prsht Rev.	: NC	Material	:	
First Issue	: / / Type : SMALL /MED FAB	Due Date	: 11/30/2007	Qty: 1 Um: Each
Previous Run	: 35019			
Written By	: 			
Checked & Approved By	:			
Comment	: Est Rev:A New Issue 07-09-27 DD verified by: EC			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	G89	coated cloth
-----	-----	--------------



Comment: Qty.: 0.3258 sf(s)/Unit Total : 0.3258 sf(s)

G-89 coated cloth


Batch: M105928 07.11.23

2.0	WATER JET	FLOW WATER JET
-----	-----------	----------------



Comment: FLOW WATER JET

1-Cut as per Dwg D3682

Dwg Rev: V/RProg Rev: V/R 07.11.23

2-Deburr if necessary

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
-----	-----	--




Comment: INSPECT PARTS AS THEY COME OFF MACHINE

 07.11.23

4.0	QC8	SECOND CHECK
-----	-----	--------------



Comment: SECOND CHECK

 07.11.23


5.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

 07.11.23 (1)

Date: Friday, 11/23/2007 11:53:44 AM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: GASKET

Job Number: 35974

Part Number: D36821

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



DOX11127
U 07.11.27

ADD 59
56
5c

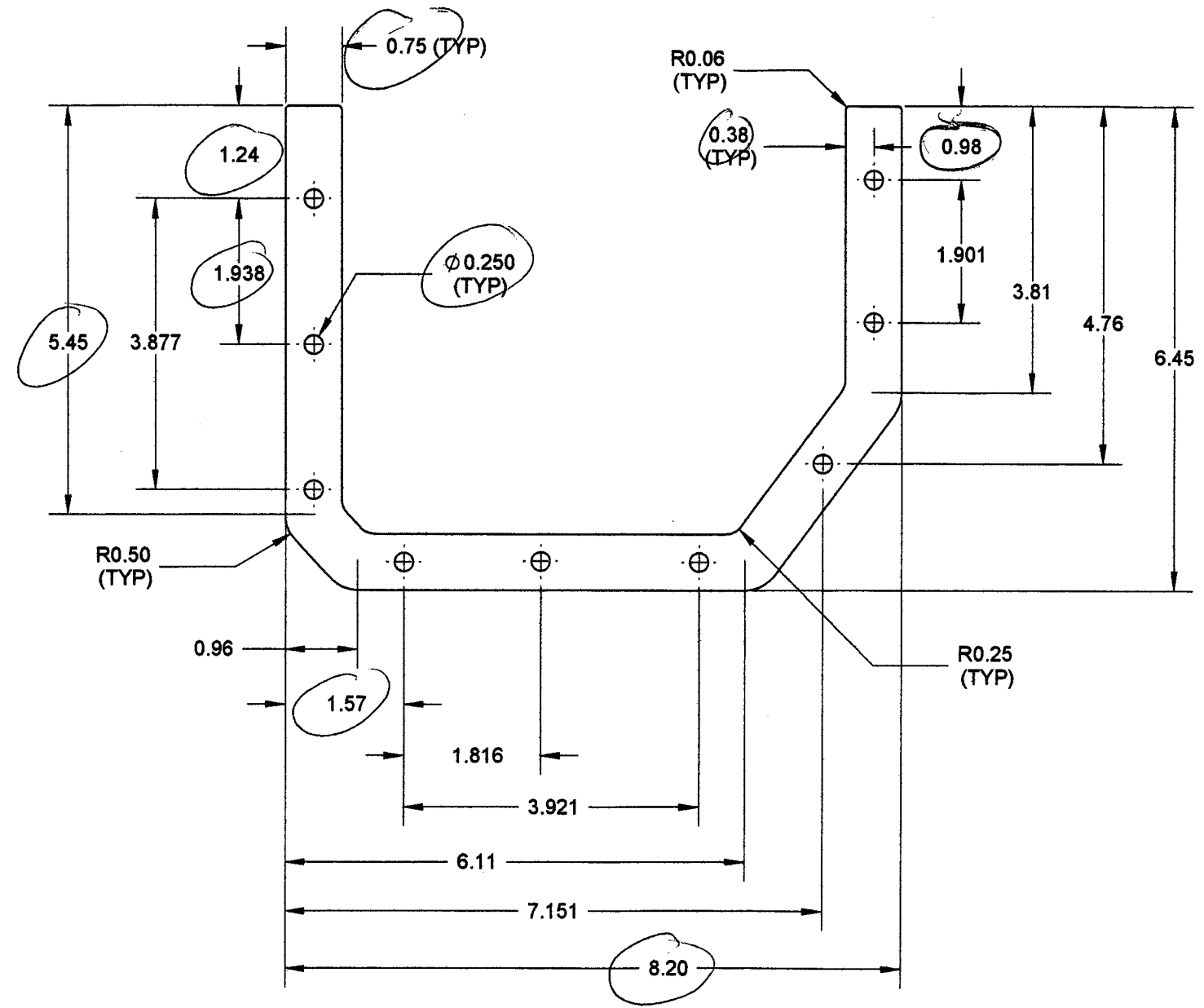
SEE ATTACHED

U 07.11.23

POSITIVE RECALL

EFFECTIVE 07.11.23 AUTH U

RELEASED _____ DATE _____



D3682-1 GASKET

PRELIMINARY ISSUE

- NOTES:
- 1) MATERIAL: THERMO-CHEM P/N G-89, (REF. 0.060 THICK)
POSSIBLE SUPPLIER: A.R. THOMSON GROUP
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3682-1 USING FINE POINT PERMANENT INK MARKER
 - 7) WEIGHT: 0.05 lbs

A	NEW ISSUE	RF	07.11.07
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3682	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		GASKET	1:2
DATE	07.11.07	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/ 35974

Step 5a

VE

07.11.23

Tag with positive recall and transfer to Dart Engineering Calgary, Attention Roberto Fuentes

07.11.23

Step 5b

VE

07.11.23

QC5 (Upon receipt of STC)

Step 5c

VE

07.11.23

Remove positive recall and release part to Eagle Copters

DART AEROSPACE LTD		Work Order: 35974
Description: Crosstube Assembly		Part Number: D3682-1
Inspection Dwg:	Rev:	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.75	+ 0.03	0.752	✓			
	1.24	"	1.245	✓			
	1.938	"	1.946	✓			
	Ø.250	+0.000 -0.001	Ø.252	✓			
	5.45	± 0.03	N/A				
	1.57	"	1.580	✓			
	8.20	"	8.187	✓			
	0.98	"	0.985	✓			
	0.38	"	0.387	✓			
SIDE B							

Measured by: <i>IE</i>	Audited by: <i>VB</i>	Prototype Approval:	N/A
Date: 07.11.23	Date: 07.11.23	Date:	N/A

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



DART AEROSPACE LTD
1270 Aberdeen Street
Hawkesbury, ON, K6A 1K7
CANADA

Tel: 613 632 5200

Fax: 613 632 1185


Email: heli@dartaero.com
Web Site: www.dartaero.com

CERTIFICATE OF CONFORMANCE

Part no:	Description:	Drawing:	Quantity:	Batch:
D3648-041	Drive Shaft Tunnel	D3648 Rev. A	One	35973
D3654-1	Doubler	D3654 Rev. A	One	35899
D3682-1	Gasket	D3682 Rev. A	One	35974

ALL MATERIALS AND PARTS HAVE BEEN INSPECTED AND COMPLY WITH THE
DRAWINGS LISTED ABOVE.

DATE: 7/Jan/2008


BY: Susanne Sheldon, eng
APPROVED QA SIGNATORY


Leanne Elsliger, P. Eng
DESIGN ENGINEER

Ref: D3648041 per Lea Date: 11/23/2007
Jap: Wgt: 7.0 LBS

SHIPPING: 182.00
SPECIAL: 44.87
HANDLING: 0.00
TOTAL: 226.87

PV.

0.00

Sves: PRIORITY OVERNIGHT
TRCK: 9018 2252 4627

ORIGIN ID: YMXA (613) 632-3336
BRIGITTE GOLDEN
DART AEROSPACE LTD
1270 ABERDEEN ST

Ship Date: 23NOV07
ActWgt: 7.0 LB MAN
System#: 01740311/CAFE2352
Account: 5 *****
Dimmed: 61x18x16 IN

HAWKESBURY, ON K6A1K7
CANADA CA

TO DAVID SHEPHERD/ROBERTO
DART AEROSPACE LTD
823 MCTAVISH RD. N.E.
MID HANGAR
CALGARY, AB T2E7G9

(403) 250-7370

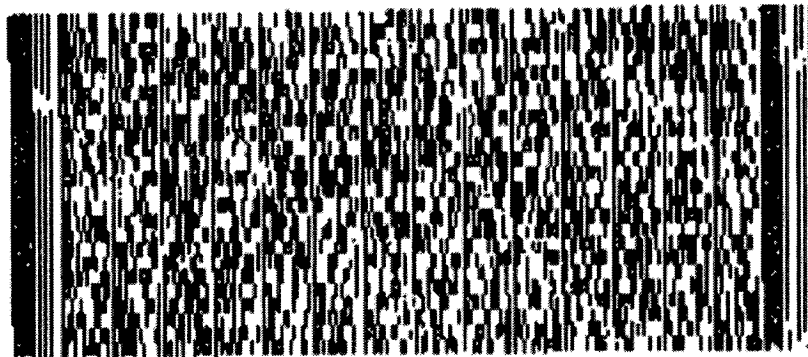
FedEx
Express



CL30000007/23/07

(CA)

Ref: D3648041 per Leanne



Delivery Address
Barcode

BILL SENDER

PRIORITY OVERNIGHT

TRKA 9018 2252 4627

Form
0451

MON

Deliver By:
26NOV07

YYC

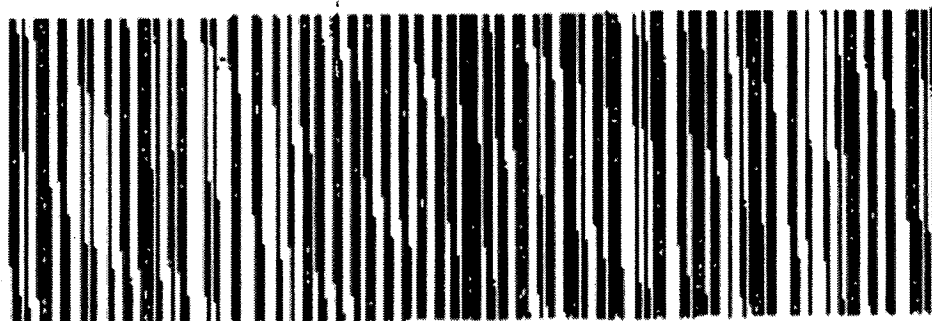
A1

T2E7G9 -AB-CA

5B

YYCA

20111123 03:40:11 NEW 0207



Date: Friday, 10/5/2007 7:59:54 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Job Number : 35019

Estimate Number : 13035

P.O. Number :

This Issue : 10/5/2007 S.O. No. :

Prsht Rev. : NC

First Issue : / / Type : SMALL /MED FAB

Previous Run :

Written By : 

Checked & Approved By :

Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC

Drawing Name : AFT BASE

PROTOTYPE

Part Number : D36511

Drawing Number : D3651 UNDER REVIEW

Project Number : N/A

Drawing Revision : U/R

Material :

Due Date : 10/12/2007

FOR ENGINEERING USE ONLY

Qty: 2 Um: Each

Additional Product

Job Number:



Seq. #:

Machine Or Operation:

Description :

1.0

G89

coated cloth



Comment: Qty.: 0.4883 sf(s)/Unit Total : 0.9765 sf(s)

G-89 coated cloth

Batch: 105823

1807-10-9

**CERTIFICATE OF CONFORMITY
REQUIRED**

Not
Required
(308 B.M.C. per 1807-10-9)

2.0

WATER JET

FLOW WATER JET



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PRE

Prog Rev: PRE

1807-10-9

①

2-Deburr if necessary

3.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



1807-10-9

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0

QC8

SECOND CHECK

**ENGINEERING
APPROVAL**

Comment: SECOND CHECK

1807-10-10

1807-10-10 (1)

5.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

FOR ENGINEERING USE ONLY

Date: Friday, 10/5/2007 7:59:54 AM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35019

Part Number: D36511

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE

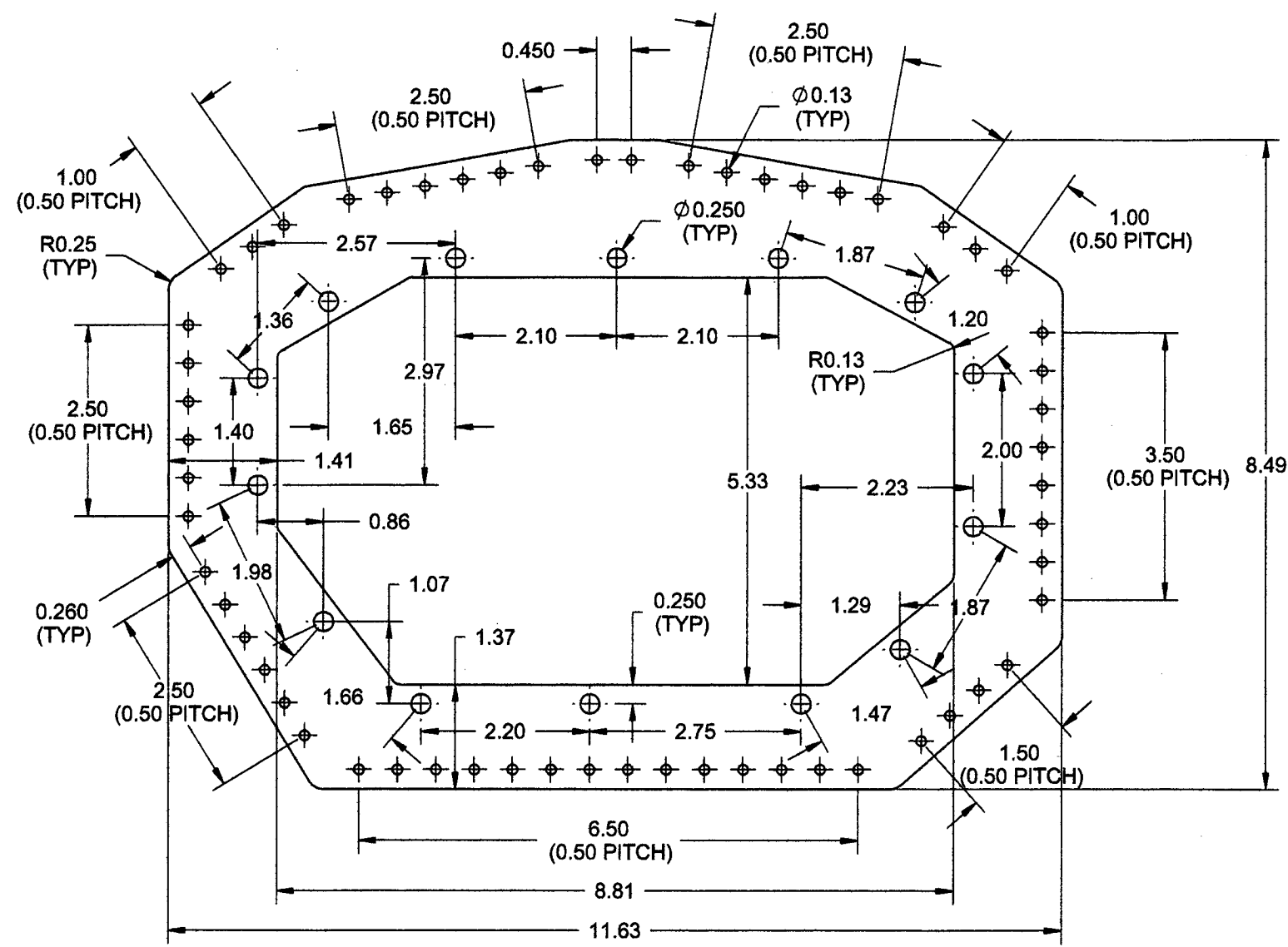


Comment: FINAL INSPECTION/W/O RELEASE

207/11/07

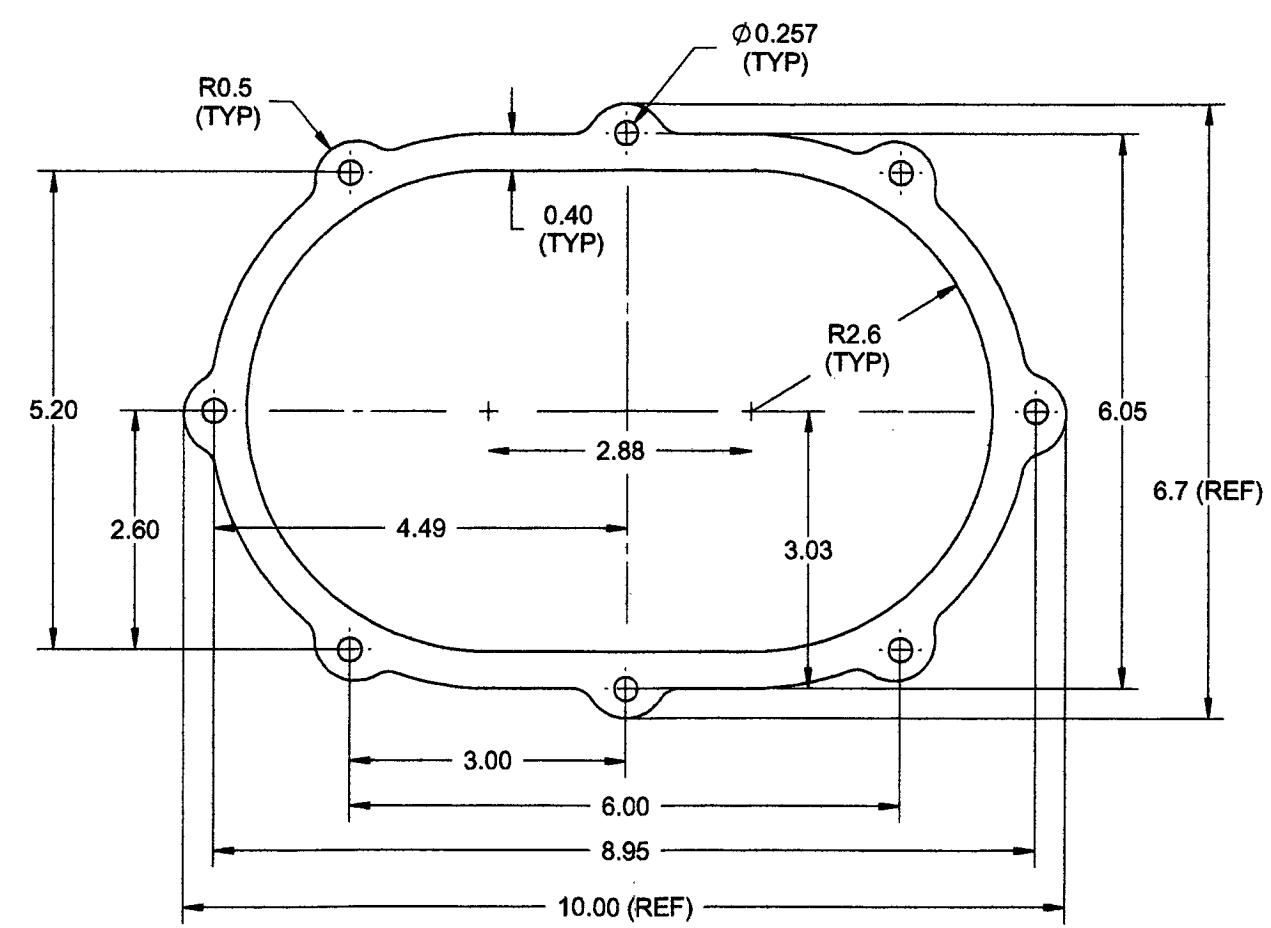
Job Completion





D3651-11 GASKET
 DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
 TRANSFER $\phi 0.129$ HOLES FROM D3651-5/-7 WELDED ASSEMBLY
 TRANSFER $\phi 0.250$ HOLES FROM D3649-041/D3650-041 SECTION A-A

- NOTES:**
- 1) MATERIAL: THERMO-CHEM P/N G-89
POSSIBLE SUPPLIER: A.R. THOMSON GROUP
 - 2) FINISH: NONE
 - 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) ALL DIMENSIONS ARE IN INCHES
 - 5) MACHINE PER DRAWING "D3651.A2"



D3551-1 GASKET

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED	DRAWING NO. D3651	REV. A SHEET 2 OF 5
DATE 07.09.10		TITLE AFT BASE	SCALE 1:2
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Marc Bellavance

From: Roberto Fuentes [rfuentes@dartaero.com]
Sent: October 10, 2007 12:01 PM
To: 'Marc Bellavance'
Subject: RE: D3651-1/-11

I forgot is no structural test only fit and functionality, but material use for prototype it is not necessary to have all the cert, because according to Eric they don't have enough material to do D3651-1, he will use rubber for this prototype, but for the part will be use for conformity will required the cert for all the material use to make it the tunnel, I try with Frank if he can let me a copy for gasket material Eagle sent to make those gaskets.

Roberto

From: Marc Bellavance [mailto:mbellavance@dartaero.com]
Sent: Wednesday, October 10, 2007 8:58 AM
To: 'Roberto Fuentes'
Subject: D3651-1/-11

Roberto,

I did a dimensional check on D3651-1/-11 Gaskets.

I have signed the FAI sheet but as for the W/O, I prefer not to sign it because there are no material specs attached to it and the W/O is indicating there should be there. I was told that the material comes from Eagle, and that no certs were supplied with the material.

Do you intend to do some structural testing on this?

If it's the case, then you will need the certs.

If not, let me know and I will cross out the "Certification of Conformity" note that was stamped on the W/O and I will sign it off.

Thanks!

Marc

10/10/2007

Date: Friday, 10/5/2007 8:02:49 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
 Job Number : 35022
 Estimate Number : 13036

Drawing Name : AFT BASE

PROTOTYPE

P.O. Number :
 This Issue : 10/5/2007 S.O. No. :

Part Number : D365111
 Drawing Number : D3651 UNDER REVIEW

Prsht Rev. : NC

Project Number : N/A

FOR ENGINEERING USE ONLY

First Issue : / / Type : SMALL /MED FAB

Drawing Revision : U/R

Previous Run :

Material :

Due Date : 10/12/2007 Qty: 2 Um: Each

Written By : FE

Checked & Approved By : _____

Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC

Additional Product

Job Number:



Seq. #: Machine Or Operation:

Description :

1.0 G89 coated cloth



Comment: Qty.: 0.7203 sf(s)/Unit Total : 1.4406 sf(s)

G-89 coated cloth

Batch: 105 823 HB 07-10-9

**CERTIFICATE OF CONFORMITY
REQUIRED**NOT REQUIRED
(PBA ATTACHED)

E-Mail From: [unclear] 07.10.10

2.0 WATER JET FLOW WATER JET

Comment: FLOW WATER JET
1-Cut as per Dwg D3651Dwg Rev: PRE HB 07-10-9
Prog Rev: PRE

①

2-Deburr if necessary

3.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0 QC8 SECOND CHECK

**ENGINEERING
APPROVAL**

Comment: SECOND CHECK

HB 07-10-9 / EC 07/10/07

5.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock
Location: _____**FOR ENGINEERING USE ONLY**

Date: Friday, 10/5/2007 8:02:49 AM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35022

Part Number: D365111

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE

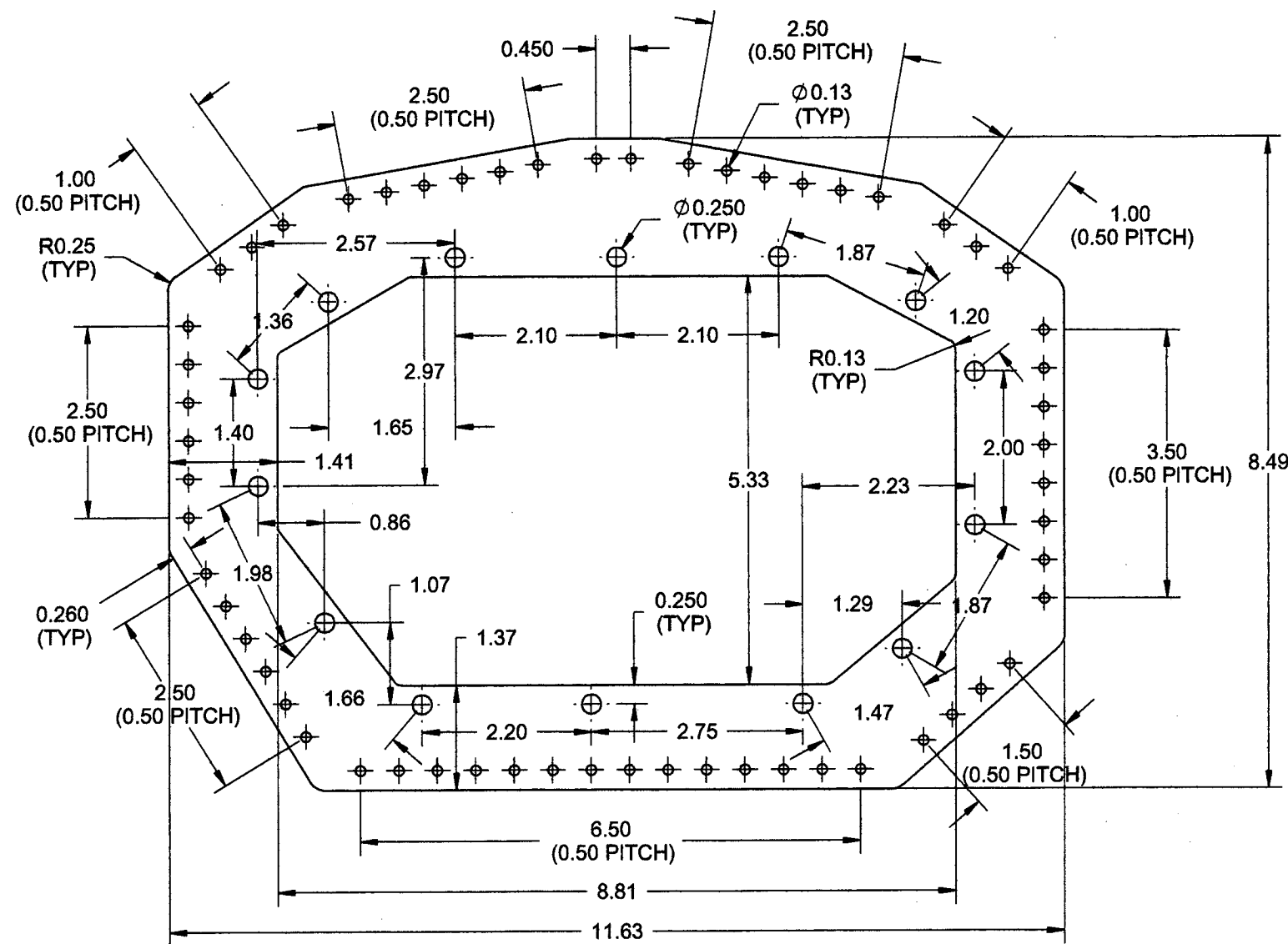


Comment: FINAL INSPECTION/W/O RELEASE

PP 07/11/27

Job Completion

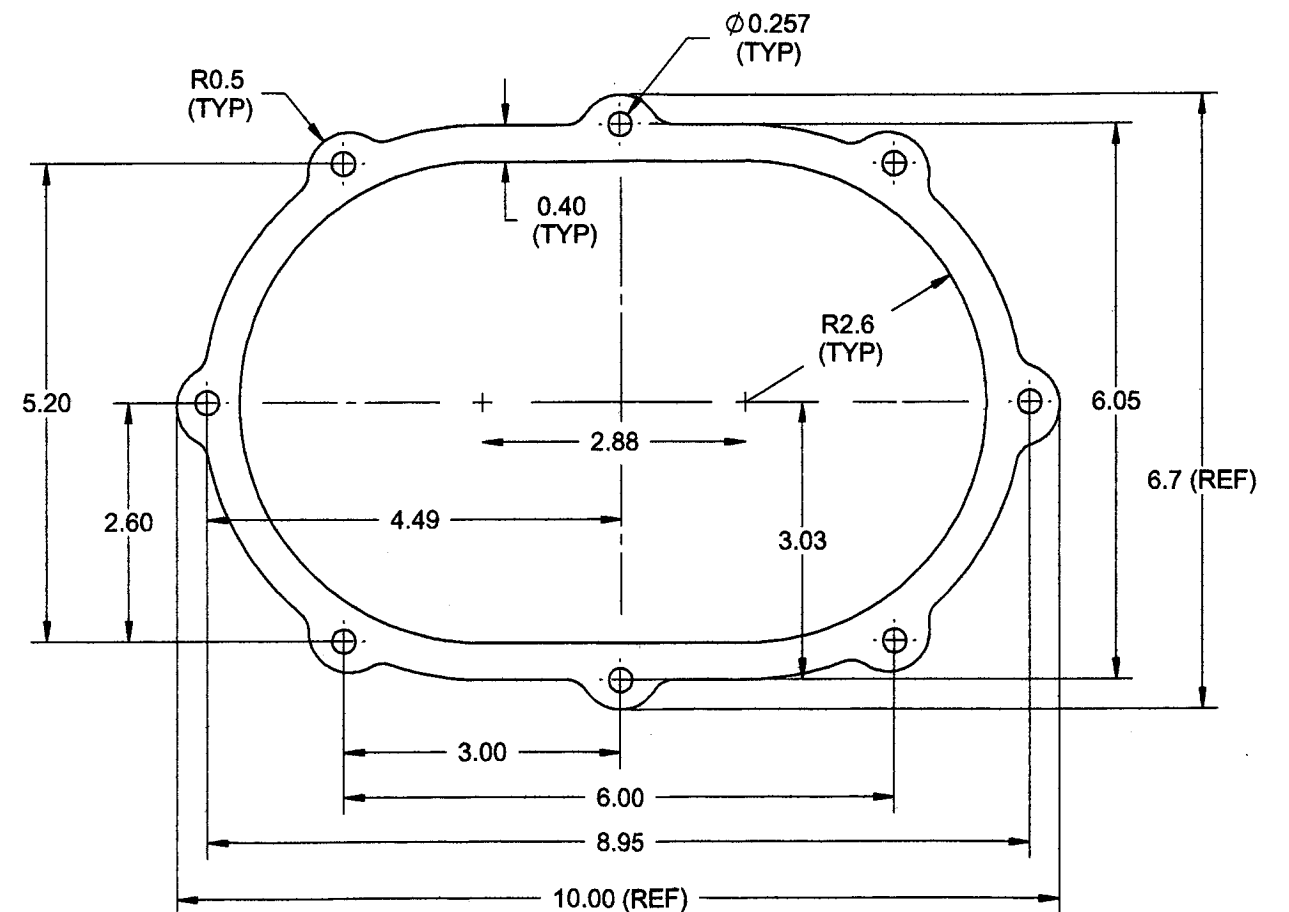




D3651-11 GASKET
 DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
 TRANSFER $\phi 0.129$ HOLES FROM D3651-5/-7 WELDED ASSEMBLY
 TRANSFER $\phi 0.250$ HOLES FROM D3649-041/D3650-041 SECTION A-A

NOTES:

- 1) MATERIAL: THERMO-CHEM P/N G-89
POSSIBLE SUPPLIER: A.R. THOMSON GROUP
- 2) FINISH: NONE
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) MACHINE PER DRAWING "D3651.A2"



D3551-1 GASKET

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED	DRAWING NO. D3651	REV. A SHEET 2 OF 5
DATE 07.09.10		TITLE AFT BASE	SCALE 1:2
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Marc Bellavance

From: Roberto Fuentes [rfuentes@dartaero.com]
Sent: October 10, 2007 12:01 PM
To: 'Marc Bellavance'
Subject: RE: D3651-1/-11

I forgot is no structural test only fit and functionality, but material use for prototype it is not necessary to have all the cert, because according to Eric they don't have enough material to do D3651-1, he will use rubber for this prototype, but for the part will be use for conformity will required the cert for all the material use to make it the tunnel, I try with Frank if he can let me a copy for gasket material Eagle sent to make those gaskets.

Roberto

From: Marc Bellavance [mailto:mbellavance@dartaero.com]
Sent: Wednesday, October 10, 2007 8:58 AM
To: 'Roberto Fuentes'
Subject: D3651-1/-11

Roberto,

I did a dimensional check on D3651-1/-11 Gaskets.

I have signed the FAI sheet but as for the W/O, I prefer not to sign it because there are no material specs attached to it and the W/O is indicating there should be there. I was told that the material comes from Eagle, and that no certs were supplied with the material.

Do you intend to do some structural testing on this?

If it's the case, then you will need the certs.

If not, let me know and I will cross out the "Certification of Conformity" note that was stamped on the W/O and I will sign it off.

Thanks!

Marc

10/10/2007

Date: Friday, 10/5/2007 8:03:38 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Drawing Name : AFT BASE

Job Number : 35023

PROTOTYPE

Estimate Number : 13037

P.O. Number :

Part Number : D365113

This Issue : 10/5/2007 S.O. No. :

Drawing Number : D3651 UNDER REVIEW

Prsht Rev. : NC

Project Number : N/A

FOR ENGINEERING USE ONLY

First Issue : / / Type : SMALL / MED FAB

Drawing Revision : U/R

Previous Run :

Material :

Written By : EC

Due Date : 10/12/2007

Qty: 2 Um: Each

Checked & Approved By :

Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC

Additional Product

Job Number:



Seq. #: Machine Or Operation:

Description :

1.0 M304S24GA

304/316 .025 Sheet



Comment: Qty.: 0.7140 sf(s)/Unit Total : 1.4280 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: M105592 IB 07-10-9**CERTIFICATE OF CONFORMITY
REQUIRED**

2.0 WATER JET

FLOW WATER JET



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PREProg Rev: PREIB 07-10-9

2-Deburr if necessary

IB 07-10-9

3.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE

IB 07-10-9

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0 QC8

SECOND CHECK

**ENGINEERING
APPROVAL**

Comment: SECOND CHECK

IB 07-10-10 10/07/09

5.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: **FOR ENGINEERING USE ONLY**

Date: Friday, 10/5/2007 8:03:38 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35023

Part Number: D365113

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE

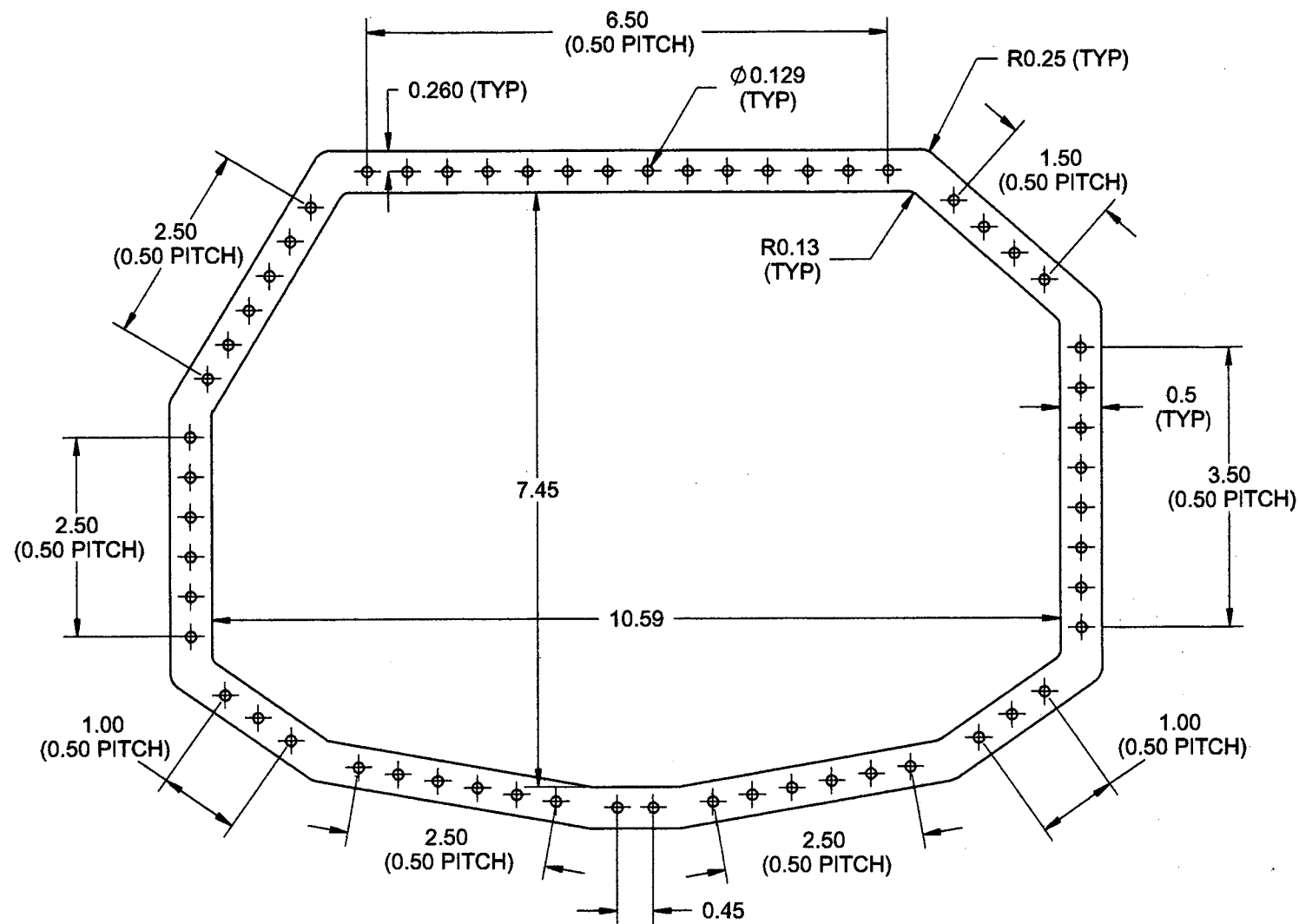


Comment: FINAL INSPECTION/W/O RELEASE

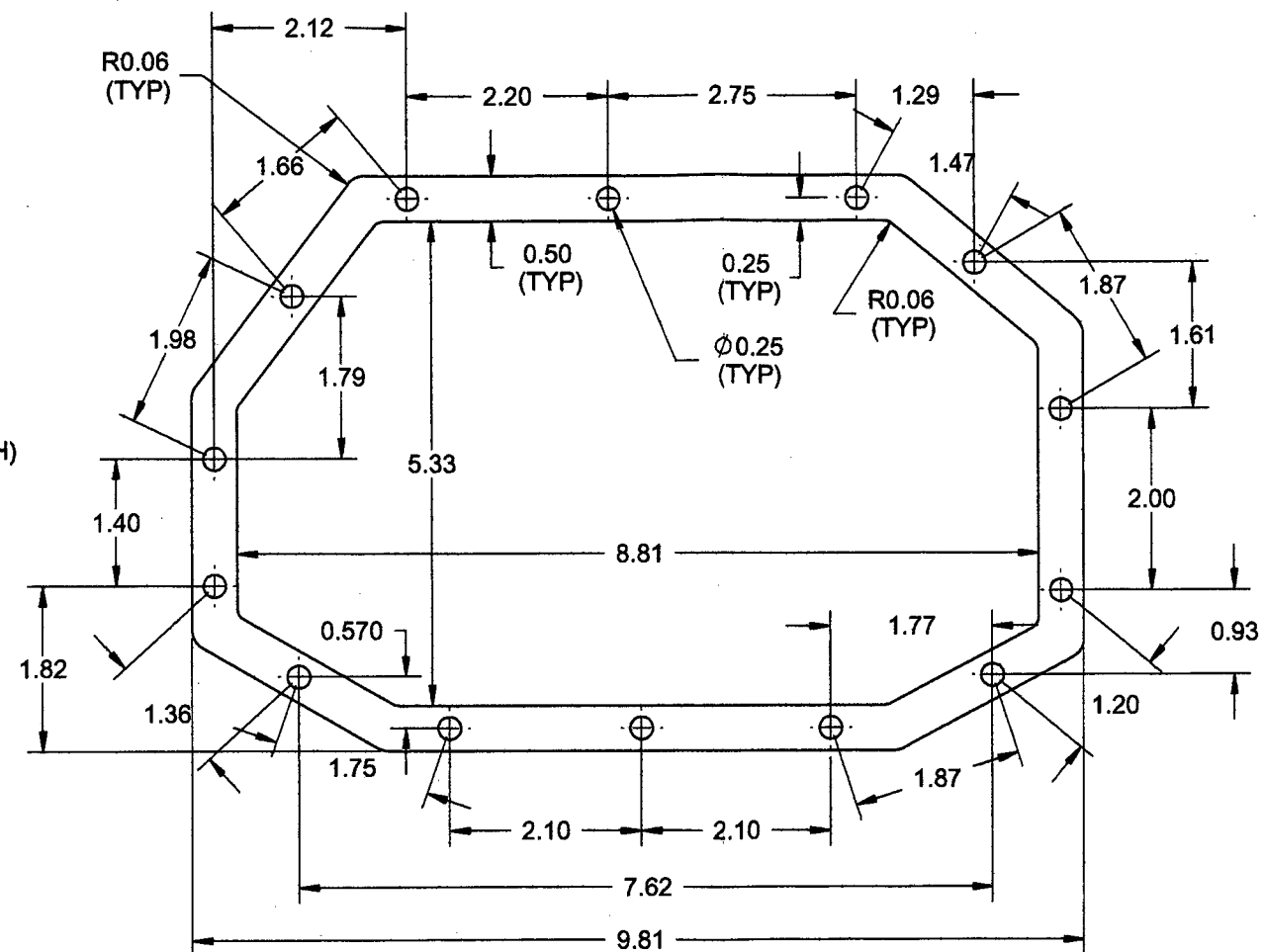
207/11/23

Job Completion





D3651-13 DOUBLER
DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
TRANSFER $\varnothing 0.129$ HOLES FROM D3651-5/-7 WELDED



D3651-9 DOUBLER
DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
TRANSFER $\varnothing 0.250$ HOLES FROM D3649-041/D3650-041 SECTION A-A

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) BREAK ALL SHARP EDGES 0.005 TO 0.010
- 6) MACHINE PER DRAWING "D3651.A5"

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED	DRAWING NO. D3651	REV. A SHEET 5 OF 5
DATE 07.09.10		TITLE AFT BASE	SCALE 1:4
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Hawksbury, Ontario K6A 1K7
Phone: (613) 632-3336
Fax: (613) 632-4443

Purchase From:

Campi Steel
935 Boul. Du Havre
Valleyfield, QC J6S 5L1

Ship To:

Main Finished Goods Location
Dart Aerospace Ltd
1270 Aberdeen St
Hawksbury, Ontario K6A 1K7

Reference	Description	Contact	Vendor Number	PO Number
			VC-CAM002	PO00004550

Vendor Item Number	Item Number	Description	Qty. Received	UOM	Unit Cost	Extended Cost	Arrival Date
	M304S24GA	304/316 .025 Sheet PER MIL-S-5019 (ANNEALED) 2 B FINISH MATERIAL: AISI 304/316 SS SHEET B/N105592	96.0000	sf	5.600000	537.60	Sep 13, 2007

Comments:

10004 BU104

Certificate of Mill Test Results
BL TO 003681-002 23Mar07
Pg 1/1

YIEH MAU CORP.

MILL TEST CERTIFICATE

INVOICE NO. FORM 848
COMMODITY PRIME COLD ROLLED STAINLESS STEEL SHEET

SPECIFICATION: AISI 304, ASTM A240/A430
CUSTOMER

Inox

24 Ja 48 X 96

ORIGINAL

388, SHUN AN RD. LI CHU HSIANG
KACHUNG TAIWAN R.O.O.
TEL: 03-678986 FAX: 03-678986
CERTIFICATE NO. YMC848
DATE OF ISSUE: 07/01/2008
PAGE 4

24 Ja 48 x 96

SIZE	NO.	Weight (N.W.)		Heat No.	ID NO.	Physical Properties Tensile Test QL-SD min					Chemical Composition (%)							
		KGS	LBS			YS (N/mm ²)	TS (N/mm ²)	EL (%)	HRB	HV	C x100	Si x100	Mn x100	P x1000	S x1000	Ni x100	Cr x100	N x100
		AISI 304 (WITH PAPER INTERLEAVED)																
240A/48" X 96"	1	1,403	3,091	TX404411	55873255B-1	367	660	56	80	155	4	84	181	27	1	807	1818	4.9
240A/48" X 96"	1	1,403	3,091	TX404411	55873255B-2	367	660	56	80	155	4	84	181	27	1	807	1818	4.9
240A/48" X 96"	1	1,404	3,093	TX404411	55873255B-3	367	660	56	80	155	4	84	181	27	1	807	1818	4.9
240A/48" X 96"	1	1,518	3,347	TX404399	55873255B-21	388	671	57	80	156	4.3	83	187	25	1	803	1830	5
240A/48" X 96"	2	1,617	3,564	TX404399	55873255B-22	388	671	57	80	156	4.3	83	187	25	1	803	1830	5
240A/48" X 96"	1	1,476	3,254	TX404399	55873255B-24	388	671	57	80	156	4.2	83	187	25	1	803	1810	5
TOTAL: 6 8,710 19,248																		
REMARKS: NO MERCURY CONTAMINATION																		
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE MILL CERTIFICATE.																		

Good test good for all Heat NO.

YIEH MAU CORP.

Liu Kun Hsing
Manager of Quality Assurance Section

Date: Friday, 10/5/2007 8:02:06 AM
User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Drawing Name : AFT BASE

Job Number : 35021

Estimate Number : 13033

P.O. Number :

This Issue : 10/5/2007 S.O. No. :

Prsht Rev. : NC

First Issue : / / Type : SMALL / MED FAB

Previous Run :

Written By : FE

Checked & Approved By : _____

Comment : Est Rev:A New Issue 07-09-27 DD verified by: EC

Part Number : D36519

Drawing Number : D3651 UNDER REVIEW

Project Number : N/A

Drawing Revision : U/R

Material :

Due Date : 10/12/2007

FOR ENGINEERING USE ONLY

Qty: 2 Um: Each

PROTOTYPE

Additional Product

Job Number:



Seq. #: Machine Or Operation:

Description :

1.0 M304S24GA

304/316 .025 Sheet



Comment: Qty.: 0.4526 sf(s)/Unit Total : 0.9051 sf(s)

304/316 SS sheet 24 ga (0.025" thick)

Batch: 105592 HB 07-10-9

CERTIFICATE OF CONFORMITY
REQUIRED

2.0 WATER JET

FLOW WATER JET



Comment: FLOW WATER JET

1-Cut as per Dwg D3651

Dwg Rev: PRE HB 07-10-9

Prog Rev: PRE HB 07-10-9

2-Deburr if necessary HB 07-10-9

②

3.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



HB 07-10-9

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0 QC8

SECOND CHECK

ENGINEERING
APPROVAL

Comment: SECOND CHECK

HB 07-10-9

HB 07-10-9

5.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

FOR ENGINEERING USE ONLY

Identify and check

Location: _____

Date: Friday, 10/5/2007 8:02:06 AM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT BASE

Job Number: 35021

Part Number: D36519

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE

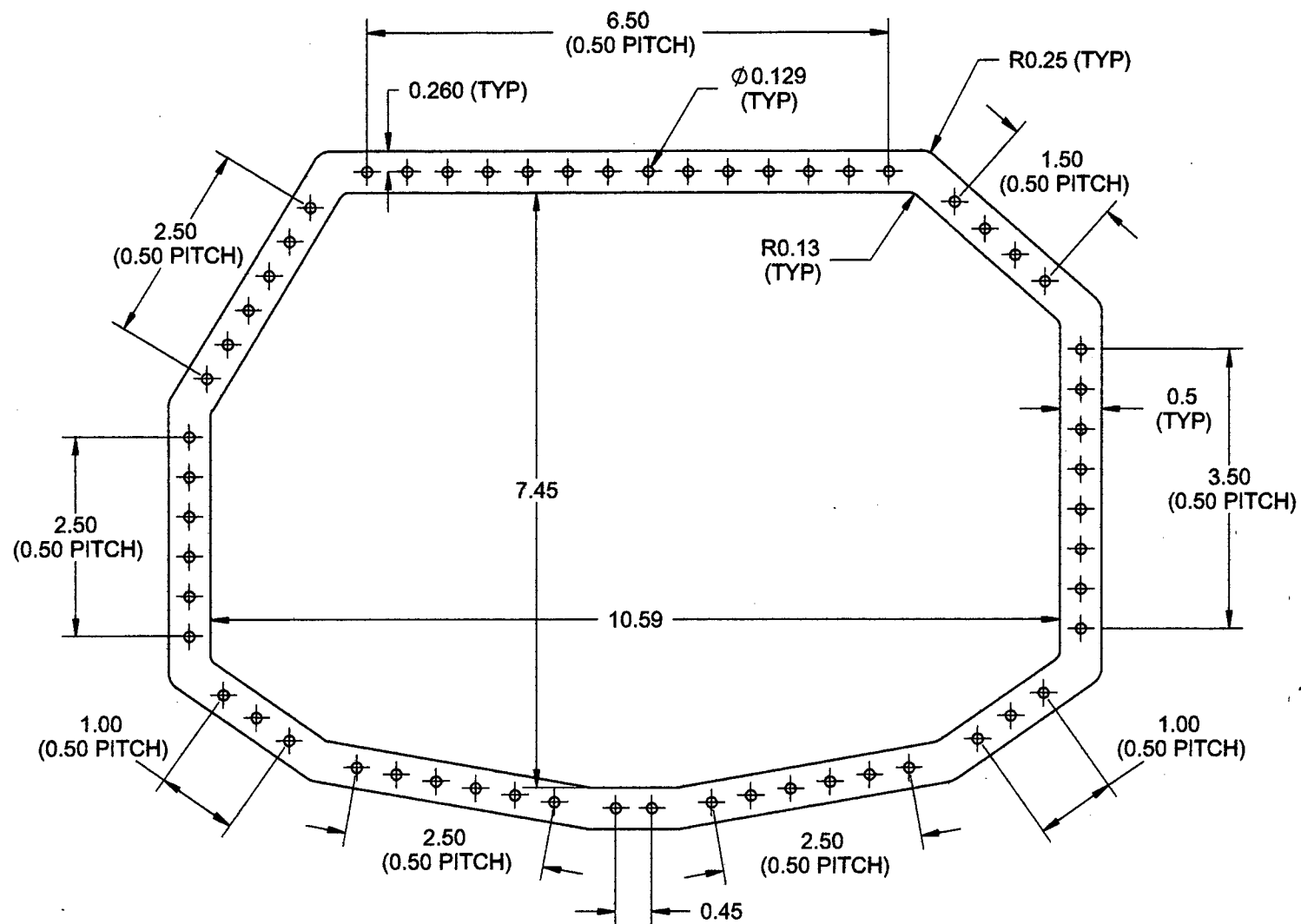


Comment: FINAL INSPECTION/W/O RELEASE

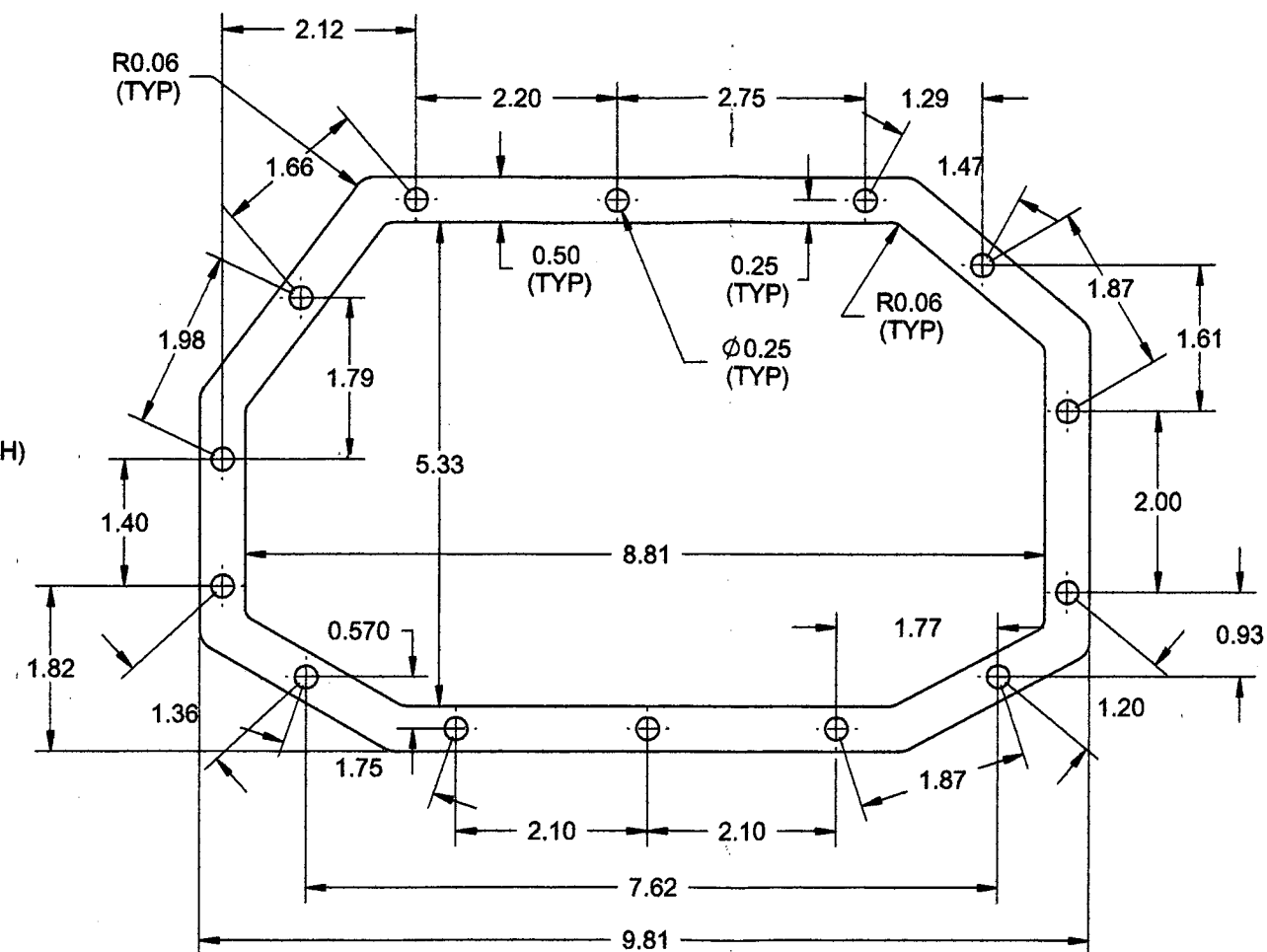
2007/11/27

Job Completion





D3651-13 DOUBLER
 DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
 TRANSFER $\varnothing 0.129$ HOLES FROM D3651-5/-7 WELDED



D3651-9 DOUBLER
 DIMENSIONS BETWEEN HOLES ARE PROVIDED FOR REFERENCE ONLY
 TRANSFER $\varnothing 0.250$ HOLES FROM D3649-041/D3650-041 SECTION A-A

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.025 (24 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S24GA)
- 2) FINISH: NONE
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) BREAK ALL SHARP EDGES 0.005 TO 0.010
- 6) MACHINE PER DRAWING "D3651.A5"

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED	DRAWING NO. D3651	REV. A SHEET 5 OF 5
DATE 07.09.10		TITLE AFT BASE	SCALE 1:4
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Hawksbury, Ontario K6A 1K7
Phone: (613) 632-3336
Fax: (613) 632-4443

Purchase From:

Campi Steel
935 Boul. Du Havre
Valleyfield, QC J6S 5L1

Ship To:

Main Finished Goods Location
Dart Aerospace Ltd
1270 Aberdeen St
Hawksbury, Ontario K6A 1K7

Reference	Description	Contact	Vendor Number	PO Number
			VC-CAM002	PO00004550

Vendor Item Number	Item Number	Description	Qty. Received	UOM	Unit Cost	Extended Cost	Arrival Date
	M304S24GA	304/316 .025 Sheet PER MIL-S-5019 (ANNEALED) 2 B FINISH MATERIAL: AISI 304/316 SS SHEET B/N105592	96.0000	sf	5.600000	537.60	Sep 13, 2007

Comments:

10004 BU104

Certificate of Mill Test Results
BL TO -003681-002 23Mar07
Pg 1/1

YIEH MAU CORP.

MILL TEST CERTIFICATE

INVOICE NO. : F082848
CONTRACT NO. :
PRIME COLD ROLLED STAINLESS STEEL SHEET

SPECIFICATION : AISI 304, ASTM A240/A480
COMPOSER :

Inox

24 JA 48 x 96

ORIGINAL

961, SEIKUN AN RD. LU CHU HSIANG
KAOHSIUNG TAIWAN R.O.C.
TEL:07-8978966 FAX:07-8978966
CERTIFICATE NO: F082848
DATE OF ISSUE: 07/01/2006
PAGE 4

2433A 48 X 96

CERTIFICATE NO. T804646
 DATE OF ISSUE 07/12/2008
 PAGE 4

SIZE	NO.	Weight (N.W.)		Heat No.	ID NO.	Physical Properties Tensile Test G1-50 m/s					Chemical Composition (%)							
		KGS	LB			Y.S. (MPa)	T.S. (MPa)	EL. (%)	HRB	HV	C x100	SI x100	Mn x100	P x1000	S x1000	N x100	Cr x100	N x100
AISI 304/304S (WITH PAPER INTERLEAVED)																		
24GA/48" X 96"	1	1,403	3,091	TE404411	558723253-2	287	660	58	80	158	4	84	181	27	1	807	1838	4.9
24GA/48" X 96"	1	1,403	3,091	TE404411	558723253-3	287	660	58	80	158	4	84	181	27	1	807	1838	4.9
24GA/48" X 96"	1	1,404	3,093	TE404411	558723253-3	287	660	58	80	158	4	84	181	27	1	807	1838	4.9
24GA/48" X 96"	1	1,518	3,347	TE404390	558723253-22	288	671	57	80	158	4.2	83	187	26	1	803	1830	5
24GA/48" X 96"	1	1,517	3,344	TE404390	558723253-23	288	671	57	80	158	4.2	83	187	26	1	803	1830	5
24GA/48" X 96"	1	1,478	3,254	TE404390	558723253-24	288	671	57	80	158	4.2	83	187	26	1	803	1830	5
TOTAL		8	8,719	19,203														

Remarks: NO MERCURY CONTAMINATION
 Best test record for all Heat No.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN IS

Remarks: NO IMPURITY CONTAMINATION
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE RULES OF THE MILL CERTIFICATE.

Good test record for all Heat NO.

YIEH MAU CORP.

Liu Kuo Hsing
Manager of Quality Assurance Division

Date: Monday, 10/29/2007 10:05:41 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Drawing Name : DOUBLER

Job Number : 35412

PROTOTYPE

Estimate Number : 13055

P.O. Number :

Part Number : D36541

This Issue : 10/29/2007 S.O. No. :

Drawing Number : D3654 UNDER REVIEW

Prsht Rev. : NC

Project Number : N/A

FOR ENGINEERING USE ONLY

First Issue : / / Type : SMALL /MED FAB

Drawing Revision : U/R

Previous Run :

Material :

Due Date : 11/5/2007

Qty: 1 Um: Each

Written By : 

Checked & Approved By :

Comment : Est Rev:A New Issue 07-10-29 DD verified by: EC

Additional Product

Job Number:



Seq. #: Machine Or Operation:

Description :

1.0 M304S16GA 304/316 .063 Sheet



738



Comment: Qty.: 0.3675 sf(s)/Unit Total : 0.3675 sf(s)

304/316 SS sheet 16 ga (0.063" thick)

Batch: M105130 HB07-10-29

**CERTIFICATE OF CONFORMITY
REQUIRED**

2.0 WATER JET FLOW WATER JET



Comment: FLOW WATER JET

1-Cut as per Dwg D3654

Dwg Rev: PRE-L.

Prog Rev: PRE-L.

HB07-10-29



2-Deburr if necessary

HB07-10-29

3.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



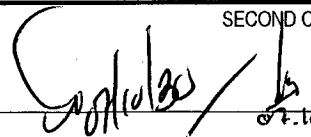
HB07-10-29

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

4.0 QC8 SECOND CHECK

**ENGINEERING
APPROVAL**

Comment: SECOND CHECK


07-10-29

5.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and stock

Location: _____

 07-10-29
FOR ENGINEERING USE ONLY

Date: Monday, 10/29/2007 10:05:41 AM

User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: DOUBLER

Job Number: 35412

Part Number: D36541

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

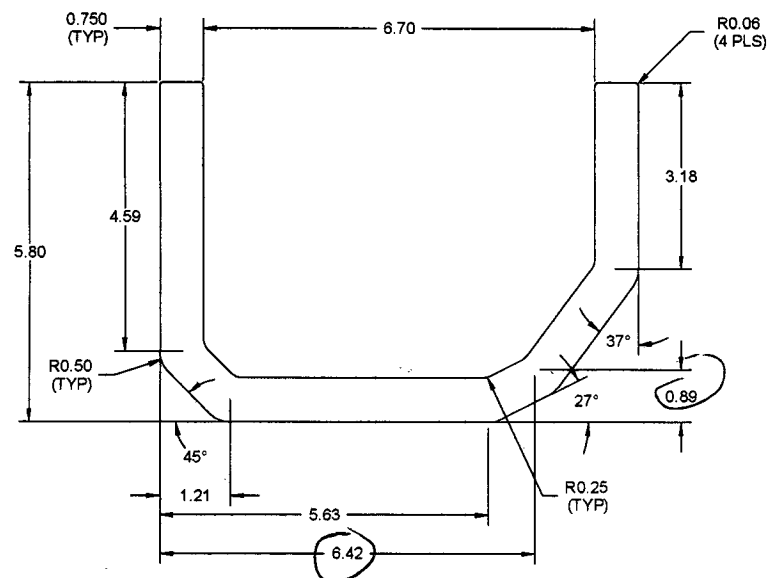
07/11/27

Job Completion



PRELIMINARY ISSUE

PROTOTYPE



D3654-1 DOUBLER

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL 0.063 (16 GAUGE) SHEET, PER MIL-S-5019 (REF. DART SPEC. M304S22GA)
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N D3654-1 USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 0.03 lbs

A	NEW ISSUE	RF	07.10.04
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		D3654	SHEET 1 OF 1
APPROVED		TITLE	SCALE
DE APPR.		DOUBLER	1:2
DATE	07.10.04	COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

